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BETTER FRUIT

VOLUME XIV

OCTOBER, 1919

NUMBER 4

FEATURES:

Advice for the Orchard Planter

Harvesting and Marketing Walnuts

Quarantine Laws as Applied to Fruit

Getting Barren Orchards to Bear

Weekly News Letter
Office of Secretary
Dept. of Agriculture



BRANCH OF HOOD RIVER SPITZENBERGS

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Time in the Northwest

BETTER FRUIT PUBLISHING COMPANY, PUBLISHERS, PORTLAND, OREGON

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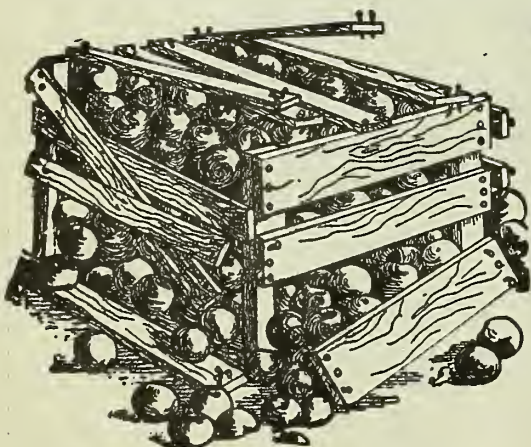
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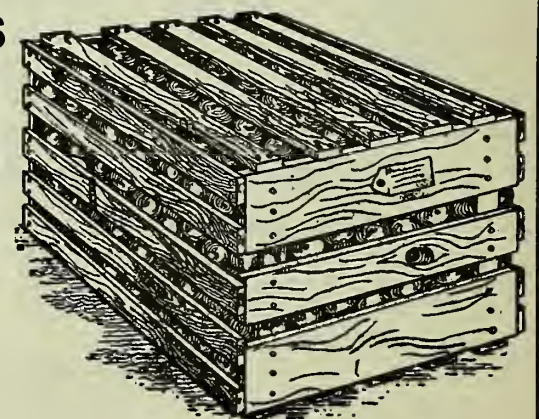
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NUMBER 4

Timely Advice for the Prospective Orchard Planter

By Gordon G. Brown, Horticulturist, Hood River Experiment Station

WHEN the Editor of BETTER FRUIT suggested that I write an article on this subject it seemed as though we were being carried back to the old days of 1909 and 1910 when advice upon the subject of planting was most plentiful. Then, we were advised to plant according to a multitude of ideas. Those who have gone through the ups and downs of the past ten years now have some pretty definite ideas of their own as to whether this advice was good or bad and also whether it was prompted by the get-rich promoter or the horticulturist of actual experience whose purposes were above reproach. Surely we have all learned.

The subject upon which I have been asked to write is a broad one and I prefer to view it in that light. It goes much beyond the mere laying off of an orchard and planting trees. What are the problems involved? To me the matter unfolds somewhat according to the following definite questions, arranged

with some idea of sequence. Considering the enormous plantings of apples a few years ago and the experiences in securing a market, is there any need of further planting? Assuming that there is such a need, shall it be on a large or small scale? Then follows another series of questions of a different character but equally, if not more, important. What variety or varieties shall I plant? Upon what kind of soil shall I set my trees? What are the details to be observed in dealing with the nursery man and finally, planting? Upon the correct answer to these depends success.

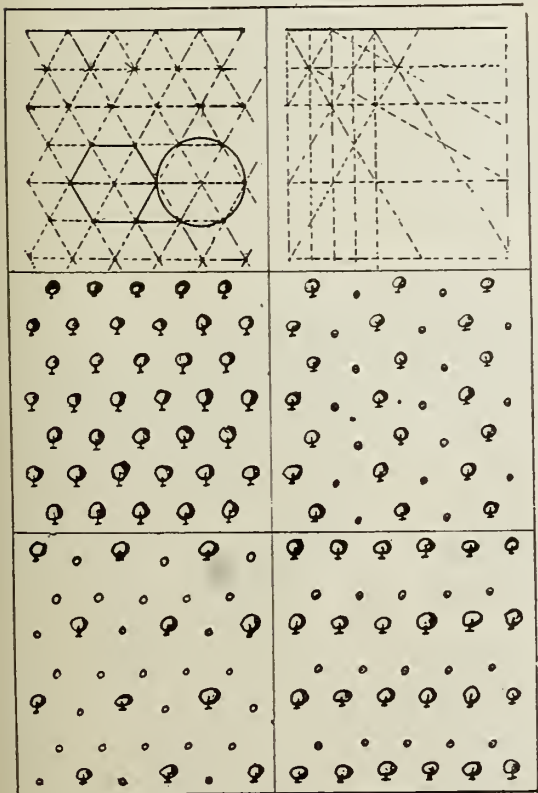
Let us go back to the first question suggested: that regarding the need of additional planting. Let us consider apple statistics recently compiled by the United States Department of Agriculture. These data point out clearly that there is no actual need for wholesale planting according to the proportions of ten years ago. On the other hand, there is an actual need for further planting upon a conservative scale for two definite reasons. Taking the United States as a whole there are comparatively few trees coming into bearing since there has been little planting since 1910. Furthermore, market demands are expanding and the productivity of certain apple districts which have furnished the bulk of the tonnage in the past is declining. This is true of Western New York which has furnished approximately one-fourth of the normal commercial apple crop of the United States. This is due largely to the fact that the trees are old. Many were planted in the late sixties. This is also true of the New England Baldwin Belt including Maine, New Hampshire, Vermont and Massachusetts. Commercially, the states of the Pacific Northwest have superceded, or at least equalled, the output of Western New York.

What of pears? Due to the ravages of fire-blight in most states the industry has declined almost to the vanishing point. This fact is now greatly reflected in gross tonnage for the United States and also in prices which are especially remunerative for all standard sorts. Canneries have paid as much as \$80.00 per ton for Bartletts and are calling for more. The industry is now largely centered in California and Ore-

gon. In the former state in 1917 there were 19,233 acres in bearing and 28,069 non-bearing. When viewed in the light of the country as a whole, the total acreage is comparatively small. There is room for additional planting of pears but on a conservative scale.

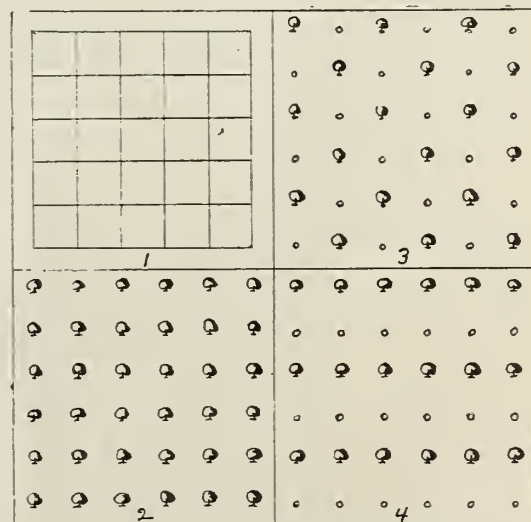
In Oregon during the past few years prices for Italian prunes have been very high. Many prune growers have made large fortunes from one or two good crops. The result has been that thousands of acres of new plantings have been set. The demand for prune trees is so great that the nurserymen are charging from fifty to seventy-five cents per tree and in some instances more. Obviously a greater market for the vast tonnage of prunes that will be borne in a few years must be found. It can scarcely be said that present high prices of prunes should be taken as a safe index of what prices may be expected when yields are doubled and trebled. There is no need for hysterical planting along this line.

What about nursery stock? The need of securing first-class trees has been emphasized so often as to be almost axiomatic. It should be vigorous, free of insects or disease, true to name, and preferably one year old from the bud. Incidentally, it is urged that the largest nursery stock is not necessarily the best. Trees four feet or higher that caliper about five-eighths of an inch just



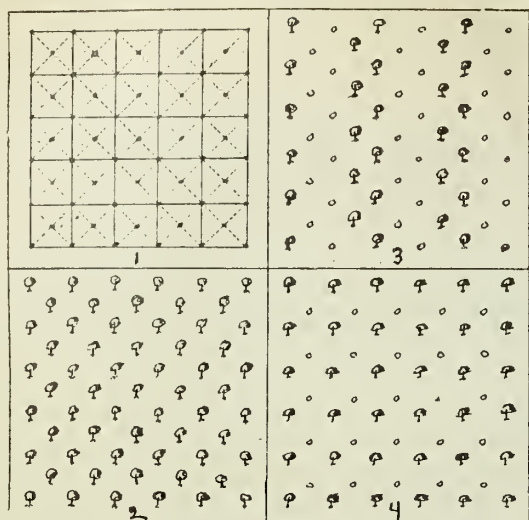
HEXAGONAL SYSTEM OF PLANTING

1, Field staked by use of triangle. 2, Field set. 3, Field properly thinned. 4, Field properly rowed off by running lines. 5 and 6, Illustrations of improper thinning.



THE RECTANGULAR SYSTEM OF PLANTING

1, Field lined. 2, Field set. 3, Proper thinning. 4, Improper thinning.



THE QUINCUNX SYSTEM OF PLANTING
1, Field staked. 2, Field set. 3, Improper thinning. 4, Proper thinning.

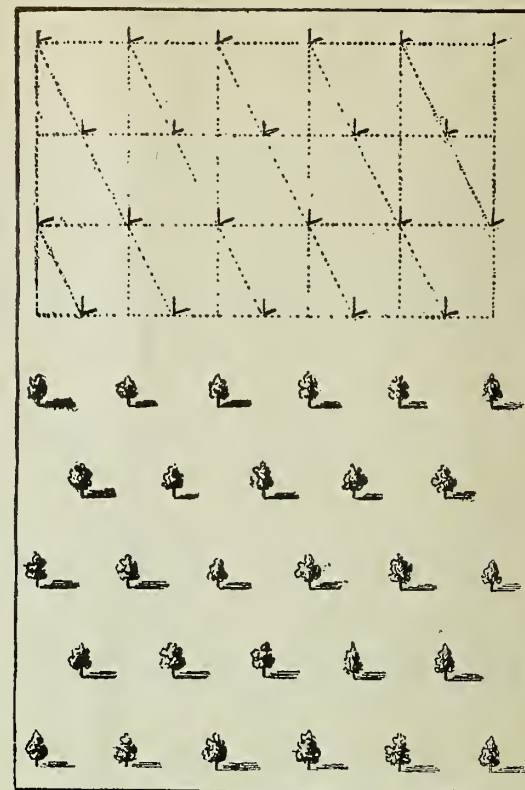
above the point at which the bud can be inserted can be considered, roughly speaking, first-class trees. As a rule they have large vigorous roots and when well planted make a greater percentage increase in trunk diameter during the first season's growth in the orchard than larger trees. One year old trees are preferred to older stock, not only because trees can be headed to better advantage but also because a two-year-old tree does not have a much greater root system after digging than does the one-year-old tree. Again, the medium sized tree is preferred to the abnormally large tree because the lower buds are stronger and more capable of developing well spaced branches than those similarly located on the large tree.

I do not know of a point in connection with nursery stock that is more worthy of emphasis than "Order Early." The planter who waits until next spring before looking after this matter is pretty likely to face an unprecedented shortage and be forced to accept cull

stock for which he will undoubtedly be charged a fancy price or go without, which is by far the lesser of the two evils. Another point of importance: Don't go bargain hunting in nursery stock if price alone is the deciding factor unless you know your business pretty well and can judge nursery stock. Better pay the full price asked by the nurseryman of established reputation, even though it may seem exorbitant, than deal with the fly-by-night agent connected with a distant firm about which you know nothing. Viewing the matter from the standpoint of the nurseryman, it is fair to say that he has had a pretty up-hill game the past few years and that in many cases present prices are justified on account of the greatly increased cost of growing trees.

The variety question is one which is easier of solution than a few years ago. All of the important ones have been tested out and the planter has an opportunity to know what to plant instead of making a guess. He will by now have appreciated that all varieties are not equally well adapted to all soils and climates. This is a lesson which has been learned at a big cost in many of our districts. The record of acreages pulled out amply testifies to this fact. It is assumed that the planter will set his trees in an established district where the variety question has been worked out. If he does not expect to do so he will be facing a very definite handicap. He will have to take his chances on variety adaptability and face many other inconveniences in growing and marketing which are found in districts with sufficient tonnage to justify coöperative effort.

Let the beginner take council with those successful in his district. Find out which varieties yield the largest tonnage year in and year out, what the



TRIANGULAR OR ALTERNATE SYSTEM OF PLANTING.

net sales price per box has been and from these data determine which varieties return the highest net profit per acre. In Hood River the Yellow Newtown and Spitzenberg are standards, both being splendidly adapted. Delicious and Winter Banana are found in limited plantings and both sell at higher prices than the two just mentioned. In Wenatchee the Winesap and Jonathan are favorites and show very high returns per acre. In British Columbia, the McIntosh, Jonathan and Wagener are most prominent.

There is probably no variety which enjoys greater popularity where known than the Delicious. It well merits this

Continued on page 26.



Illustration of a well set orchard. This view is of a young orchard in the Spokane Valley, Washington.

Harvesting and Marketing Walnuts the California Way

By J. B. Neff, Anaheim, California

WHEN the walnut hulls have opened so they will clean from the nuts readily it is best to take advantage of all dry weather by shaking the trees lightly so as to get the ripe nuts. This method adds slightly to the cost of harvesting, but is much more satisfactory than waiting for the nuts to fall if continued wet weather comes during the harvesting period. The shaking may be done with a light pole having a steel hook bolted on the end. The pole may be of spruce, or other straight grained lumber, one by one and three-quarters inches at the bottom and one by one and one-quarter inches at the top, and of any desired length.

The hook can be made of a piece of light carriage spring bent so as to make the opening three and a half to four inches and rounded on the inside to keep from cutting the bark of the branches. A short quick jar will loosen the nuts, but care must be taken to loosen only those nuts which will hull clean since any part of a hull which does not come off will adhere so closely when dry that the nut will be passed as a cull. It is best to go over the orchard about once a week in dry weather, but the nuts should be gathered from the ground oftener if the weather is rainy.

After the nuts are gathered and taken to the drying ground they should be cleaned of lint and particles of dirt by running through a cylindrical screen having a pipe above with small perforations, one-eighth inch or less, about six inches apart to allow water to spray on the nuts while the screen is turning. It is better, however, to clean the nuts without water unless particles of dirt should adhere to the nuts.

A convenient screen for small orchards can be made by using wooden heads doubled, with six-inch pipe flanges bolted outside in which to screw one-inch pipe and fittings for a bearing and crank at each end. The screen for hand work should not be more than 30 inches in diameter and four feet long, covered with any strong netting of one-half-inch mesh.

A door twelve inches wide and full length of the screen should be arranged for filling and emptying the screen. If more than ten tons of walnuts are to be handled it will pay to have a larger and more permanent cylinder and to use power of some kind, in which case the screen can be made to fill at one end and empty at the other. The nuts can be made to run from the screen to the drying trays by having a sloping floor under the screen. The nuts may be sorted when they come from the screen to remove the damaged and unsalable nuts but the final culling should be done when the nuts are dry.

The drying trays should be made of light lumber. The most convenient size is made of the following pieces: Sides 1x6x6 feet long, ends, 1x6x2 feet 10 inches long nailed together so as to have the body of the tray 3 feet by 5

feet outside and leaving 6 inches at each end of the side pieces for handles which should be cut down to 3 inches in width. For the bottom use ½-inch laths 6 feet long cut in two and nailed ½ inch apart. Also nail an extra lath on each side of the bottom to keep the short laths from coming off. They will also be strengthened if a lath is run full length in the center and nailed to each cross-lath as well as to the ends. Corner braces about 12 inches long of 1x1½-inch soft pine nailed on top of each corner adds to the strength and allows additional ventilation when the trays are piled.

Do not put more than 60 pounds of walnuts in a tray when drying and stir often, particularly if the weather should be damp. Sun drying is best when the weather will permit. The trays should be piled and covered at night or taken indoors. Light covers 3 feet by 6 feet made of shakes are very convenient as a temporary roof can be made hurriedly.

A hopper six feet long and large enough to hold 1000 pounds of walnuts placed at the proper height for filling sacks is very convenient.

When the nuts are dry, properly culled and sacked, the grower's work is done and the nuts ready for the association.

In marketing walnuts in California the method now pursued by the walnut growers of California is to form associations for walnuts exclusively. The association outputs varying from 150 tons to more than 1000 tons.

These associations take the nuts from the growers, grade, bleach and sack them, then turn them over to the California Walnut Growers' Association which sells them. The local associations equip a warehouse to handle their crop, either by selling stock, or by assessing each member according to the amount of nuts put through the house, payments being made to run over a number of years. Samples of nuts are taken from each load as brought to the packing house and if it shows the required percentage of perfect nuts, usually 85% to 87%, the load is weighed and a receipt given the owner. The nuts are kept separate until graded, bleached and culled. The amount of number one and number two nuts are then credited to the grower's account and the culls are either thrown into a common pool or a charge is made for the work of culling and the culls returned to the grower. Payment of about 75% of the selling price is made to the grower within a week and final payment when the season is over. Several methods of bleaching walnuts have been used but that in use now is known as the chlorine in which chloride of lime, sal soda and a small quantity of sulphuric acid is used. The nuts are either dipped in the solution or have it sprayed on them as they pass over shaking tables. A later and apparently more convenient plan is to buy the

chlorine solution in carboys. This solution is made by electrically decomposing salt under a high voltage and has the merit of cheapness as well as avoiding the unpleasant odors of chloride of lime.

The selling is done exclusively by the California Walnut Growers' Association which acts as the broker for the local associations. This is a non-profit, co-operative association under the laws of the State of California, composed of one member from each local association. Its purpose is to sell the walnuts of its members at the lowest possible cost and to secure the widest possible distribution of the walnuts. In this way it is hoped prices can be kept down to the consumer, a large demand developed and a reasonable profit secured for the grower.

The business of this association is carried on by a manager who is under the direct supervision of an executive committee of the board of directors.

Selling agents are appointed throughout the United States and may be either brokers or salaried agents, all of whom are under surety bonds.

The contracts with the member associations are for five years but provide that any member association may withdraw by giving notice thirty days before any annual meeting. The walnuts are pooled according to quality and time of gathering.

The California Walnut Growers' Association in order to secure uniformity of the walnuts, determines the size of screens for grading; the manner of handling and bleaching and establishes a cracking test. It also appoints inspectors to examine each lot of walnuts before shipment.

Any walnuts which will not meet the requirements as to quality of first-grade nuts are sold as off-grade, or near-grade walnuts at the best price obtainable for the account of the grower. A plant has also been established for cracking the cull walnuts of its members and the result has been that instead of selling cull walnuts for much less per pound they are now bringing the grower a good return without raising the price of walnut meats to the consumer. The association also buys all walnut bags and other materials used by the member associations, thereby making large savings.

"Pinching Back" Conserves Tree Energy.

Pinching or stopping the growth of suckers or branches that are not wanted and must eventually be removed at an earlier date seems to be a reasonable and effective manner of conserving energy and diverting it to the permanent branches of the trees. Pruning demonstrations have been very useful if for no other reason than that they have jarred many growers loose from old methods and compelled them to think deeply and reasonably upon the "whys and wherefores" of cutting the branches of trees.

Weevil Quarantines in Relation to Marketing Fruit

By W. H. Wicks, Director Idaho Bureau of Plant Industry

THE alfalfa weevil (*Pythonomus posticus*) has caused the states of Arizona, California, Nevada, Oregon, Washington, Montana and Colorado to place a quarantine against alfalfa infested counties of Idaho in common with the entire state of Utah, and certain counties in Colorado and Wyoming. Since the beginning of the spread of alfalfa weevil, it has been found in newer sections from year to year, and quarantine laws are being passed by other states, which laws are more and more rigid in regard to the movement of various products from infested sections. Alfalfa hay is the most valuable crop in the state of Idaho. The 1917 report of the State Bureau of Markets gives the following figures:

Alfalfa hay, 1,244,328 tons.....	\$18,664,920
Wheat, 9,038,537 bushels.....	13,557,805
Oats, 4,548,672 bushels.....	3,093,097
Potatoes, 2,636,229 bushels.....	2,636,229
Apples, 1,995,000 bushels.....	1,895,250
Prunes, 600 cars.....	360,000
Pears, 70,000 bushels.....	105,000
Peaches, 165,000 bushels.....	198,000

These figures show that the apple crop ranks first of all fruits in the state and the total value of the fruit output of the state, at average pre-war prices, amounts to \$2,558,250. In the movement and handling of horticultural products, including potatoes and vegetables, the alfalfa weevil quarantines play an important part.

Extent of Quarantine Regulations of Neighboring States.

Arizona quarantines entire state.

California quarantines Cassia, Bingham, Bear Lake, Oneida, Bannock, Franklin, Power, Payette and Madison.

Nevada quarantines Cassia, Bingham, Bear Lake, Oneida, Bannock, Franklin, Power, Payette and Madison.

Oregon quarantines that portion of the state of Idaho bounded on the north by the 43d parallel north latitude, on the east by the State of Wyoming, on the south by the State of Utah, on the west by 113th meridian west longi-

tude, and on the northwest by the Snake River.

Washington quarantines all counties in Idaho south of Idaho county.

Montana includes in their quarantine Cassia, Bingham, Bear Lake, Oneida, Bannock, Franklin, Power and Payette.

Colorado quarantines Cassia, Bingham, Bear Lake, Oneida, Bannock, Franklin, Madison, Power and Payette.

Upon recent investigation by the United States Department of Agriculture Bureau of Entomology, Salt Lake City, represented by Mr. George I. Reeves, being assisted by county agents, evidence has been produced resulting in the repealing of county quarantines in Idaho. This action has been officially recorded as follows:

REPEALING QUARANTINE ORDER NO. 11 Pertaining to Alfalfa Weevil

July 22, 1919.

WHEREAS, The alfalfa fields of the following counties of the State of Idaho are infested with alfalfa weevil (*Pythonomus posticus*): Bear Lake, Franklin, Oneida, Cassia, Bannock, Bingham, Madison, Power and Payette; and,

WHEREAS, Said quarantine declares and proclaims a quarantine prohibiting the shipment of alfalfa hay and cereal straw as stock food, stock bedding or packing for potatoes, fruit and nursery stock, or for any other purpose from or which has been grown in any of the above named counties to the following alfalfa-producing counties of the State, to-wit: Minidoka, Twin Falls, Lincoln, Blaine, Gooding, Camas, Elmore, Ada, Owyhee, Canyon, Gem, Boise, Washington, Adams, and Nez Perce; and,

WHEREAS, Recent investigation by the Bureau of Entomology, U. S. Department of Agriculture, has made it appear that in order to make county quarantines effective against the counties of Washington, Canyon and Ada where alfalfa weevil has recently been found, it would be necessary to quarantine also, Owyhee, Gooding, Lincoln, Blaine, Elmore, Boise, Custer, Lemhi, Idaho and Adams; and,

WHEREAS, It appears that the weevil probably always occurs from 50 to 100 miles beyond the point where it is possible to find it; and, furthermore, it has been demonstrated by careful investigation and carefully enforced quarantine regulations in Colorado and Utah that the operations of quarantine orders have proved valueless in preventing the spread of the weevil;

THEREFORE, It is hereby ordered that said quarantine No. 11, issued August 1st, 1918, be repealed and all state quarantine guardians

and deputy horticultural inspectors are hereby notified that no further quarantine regulations shall be enforced in the movement of Idaho alfalfa hay to any part of the state. This order shall take effect and be in force on and after the 22nd day of July, 1919.

MILES CANNON,
Commissioner of Agriculture.

C. C. MOORE,

Acting Governor of the State of Idaho.

Attest: ROBERT O. JONES,

Secretary of State.

It appears that it is only a matter of time when the alfalfa fields of Idaho will contain the weevil and quarantines will necessarily become state-wide, the same as those affecting the state of Utah. States which now have quarantines for the above named counties will no doubt revise their laws to include the entire state of Idaho. The marketing of alfalfa hay and products becomes more difficult as states pass more rigid quarantine laws. The outlet for alfalfa will then be either feeding it to livestock in the state, or shipping it out into states without quarantine, or in the form of alfalfa meal or similar products.

State Requirements in Moving Products from Weevil-Infested Territories.

The recent quarantine order from the State of Washington is here given as typical of the intent and purpose of other states which now have quarantine laws on this matter, which show the requirements that must be fulfilled in the movement of Idaho products into such states:

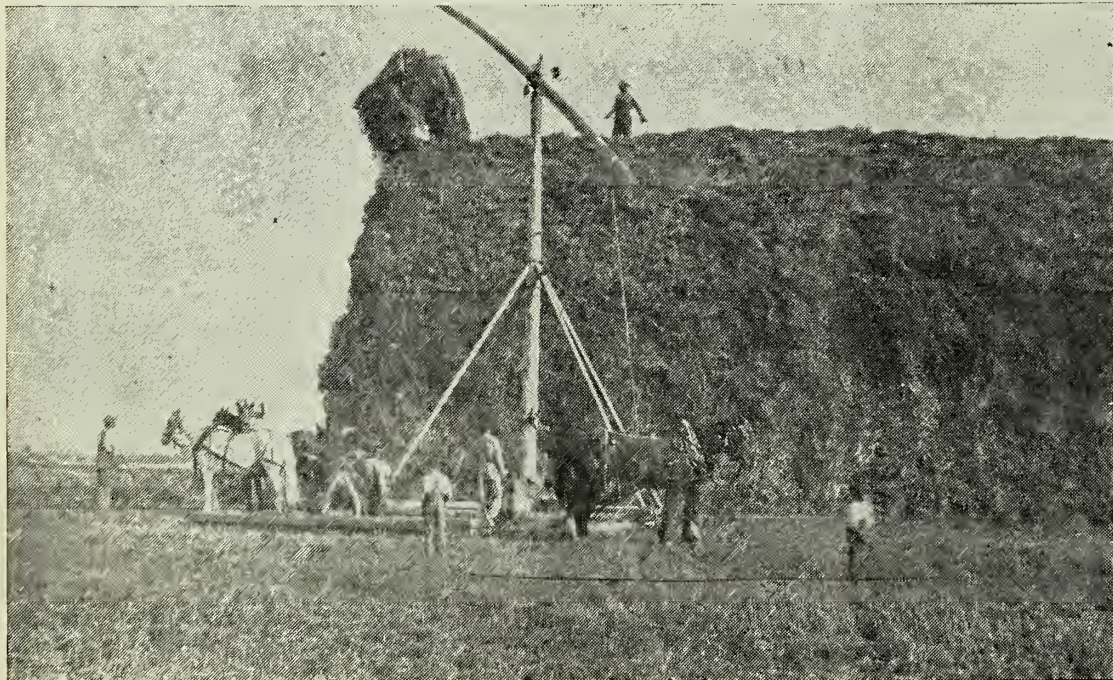
Alfalfa Weevil Quarantine.

1. Alfalfa hay and other hays of all kinds and cereal straws, excepting the material known locally in Utah as salt grass packing hay, which shall be admitted into Washington, provided that such material be cut only between the dates of October 1 and April 1, and that the raking, shocking, stacking, baling or shipping of this material as a commercial product be allowed only after the maximum daily temperature of the season has fallen below sixty degrees Fahrenheit.

Provided further, that a certificate be required from the Crop Pest Inspector of the State of Utah showing that these requirements have been met, which certificate shall accompany each shipment. Provided further, that no salt grass packing hay shall be held over in the field from one season to another. The use of salt grass hay as a packing material in shipments of fruit, crockery and other materials is permitted, provided said salt grass hay has been cut and removed from the field between October 1 and April 1 as above specified and stored in warehouses removed from alfalfa fields, alfalfa hay or other suspected materials.

2. Fresh fruits and vegetables, exclusive of potatoes, excepting under the following regulations:

a. Shipments for Washington to be made only from points designated by the recognized State Pest Inspection Officers of the State shipping into Washington, said officers to notify the De-



Alfalfa hay harvest in Southern Idaho. Alfalfa hay is the most valuable crop in the state.



Horticulturists, Entomologists and Fruit Inspectors attending second annual meeting of Western Horticulturists and Entomologists at Pullman, Wash., U. of I., Moscow and Lewiston, August 11-12-13, 1919. Workers for the development and protection of Agriculture and Horticulture.

partment of Agriculture of Washington, at Olympia, by registered mail or by telegraph of the designation of all shipping points in the aforesaid State of Utah, or all portions of the State of Idaho lying south of Idaho county; or counties of Oneida and Lincoln in Wyoming; and the county of Delta in Colorado; and the counties of Malheur and Baker in the State of Oregon; said notification to be sent and its receipt to be acknowledged before any shipments are made to the State of Washington from said designated points.

b. Shipments to be repacked from orchard or field boxes into new, clean boxes, or other fresh containers.

c. All wagons or other conveyances used in hauling to the place where repacking is conducted to be kept free from alfalfa hay or other hays, straw, and other means of contamination.

d. All packing houses to be at all times free of alfalfa hay, other hays, straw, and other means of contamination.

e. Each lot shipment shall bear an official certificate of the state from which the shipment originates stating that it has been inspected and passed in compliance with these regulations and stating where it was repacked and inspected.

3. Potatoes unless accompanied by an official certificate signed by the recognized State Pest Inspection Officer of the state from which such shipments of potatoes originate, setting forth that the potatoes have been passed over a screen, placed in fresh, clean sacks and packed in cars that are free of alfalfa hay or other means of contamination.

4. All nursery stock, unless accompanied by special certificate setting forth that such nursery stock has been fumigated for the alfalfa weevil in an airtight enclosure subsequent to being boxed, baled or packed for shipment, with cyanide of potassium or cyanide of sodium at the rate of one ounce to each one hundred cubic feet of enclosed space.

5. That no shipment of household or emigrants' movables originating in any

state or county designated as infested with the alfalfa weevil, shall be brought into the State of Washington by any common carrier, person or persons, unless such shipments be accompanied by a copy of a sworn statement made in duplicate by the owner or shipper after the following forms on blanks which will be furnished to applicants by the Department of Agriculture at Olympia, Washington. Copy No. 1 to be mailed to the State Department of Agriculture at Olympia, Washington, and Copy No. 2 to be delivered to the common carrier agent, with a special certificate appended, to attach to waybill.

Idaho Inspection Service.

In order to comply with the quarantine regulations of other states, which quarantine laws affect the marketing of Idaho products from weevil-infested territory, the Department of Agriculture through its Bureau of Markets is placing in each car of potatoes the following certificate as such car is officially inspected:

STATE OF IDAHO
Department of Agriculture
Bureau of Plant Industry

..... Idaho,, 19..

TO WHOM IT MAY CONCERN:

This is to certify that car..... shipped from..... on....., 19.... to..... by..... contains potatoes which have passed over screen and have been placed in fresh, clean sacks. The car is free from alfalfa hay, other hay, and cereal straw, and is free from alfalfa weevil.

Inspected by.....
Deputy Inspector, District No.....

It is the policy of the department to have an inspection certificate accompany each car. This procedure will aid materially in marketing Idaho products, as it sometimes happens that a car is rebilled, owing to market conditions, from its original destination and finds its way back into a state requiring such inspection and certificate.

In addition to inspection of horticultural products for quality and condition, freedom from insect pests and diseases, inspection is being given to meet the quarantine requirements of other states. The new official grades for Idaho on apples, Italian prunes, potatoes, hay, grains and leguminous seeds has brought about a state system of inspection which will give more thorough and adequate supervision of the marketing of all these commodities.

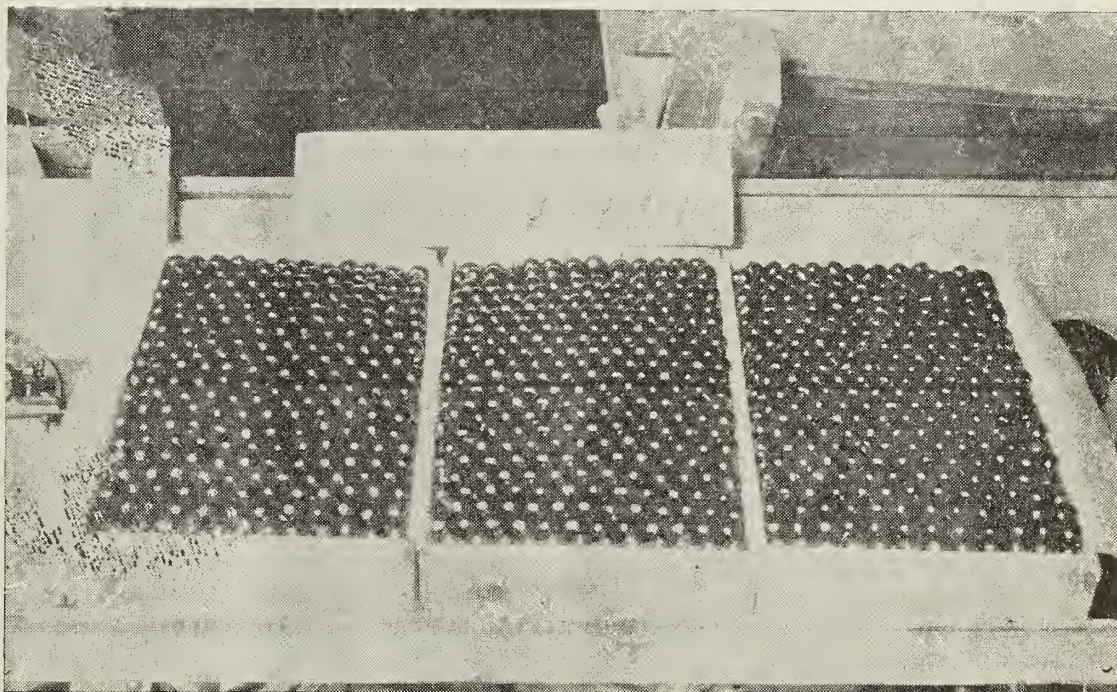
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703 Oregonian Building
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Idaho cherries commercially packed. Alfalfa quarantine laws make it more difficult to move various products from infested sections.

Science Aids Nature in Causing Barren Trees to Bear

By Harry L. Percy, Horticulturist, Amity, Oregon

THE pollenization of the sweet cherry previous to the days of large plantings was of an unknown quantity; but with the advent of the large plantings with solitary varieties or one or two varieties at most, pollenization has turned out to be the most vital of all the problems confronting the cherry grower. His trees were coming into the bearing age but there were no cherries to harvest. What caused this apparently phenomenal condition as contrasted to the heavy bearing condition of the cherry trees of the family orchard?

For years fine cherries have been raised in the Willamette Valley and at The Dalles, Oregon; the trees usually setting good crops. Being a popular fruit both in the fresh and dried state and as a canned product, it found a ready sale and proved to be a profitable crop for the orchardist to raise. Hence the large plantings of cherries of the last 12 or 13 years. When many of these plantings reached the age when they should have begun to bear large and profitable crops, it was found that they were producing little or nothing.

The above serious condition led to an investigation by the Oregon Experiment Station eight years ago. This work was carried on under the direction of Prof. V. R. Gardner. Too much credit cannot be given Prof. Gardner for the service he performed for the cherry grower in this investigation. Many theories were advanced to explain these crop failures. Frost, wind and soil conditions were all advanced as reasons for the trees not to set their fruit. Careful investigation failed to substantiate these and other theories. Much of the work of this investigation was carried on at The Dalles. The Professor set to work with a view of evolving a cherry which would bear prolifically in the Northwest. To this end he pollenated or rather cross-pollenated several varieties. The idea was to take the seed of the resulting crosses and plant them, hoping to get a seedling of the desired characteristics. This led to the important discovery that most sweet cherries were sterile and nearly inter-sterile. These discoveries led to further investigation resulting in the discovery that the leading varieties of sweet cherries, Bing, Lambert and Napoleon (Royal Anne), were self-sterile as well as inter-sterile. This explained, in a minute, why the large plantings were not bearing, for, as a rule, they consisted of no other varieties than the Bing, Lambert and Royal Anne. But, since many small plantings and "back yard or home orchard trees" were producing large crops, there must have been some variety or varieties that were furnishing fertile pollen that was causing the self-sterile and inter-sterile varieties to set large

crops. Such proved to be the case. The Black Republican was one of the first to be found to be a good pollenizer and was recommended as such. Other varieties, including the Tartarian, Coe, Elton, Wood, and many seedlings, etc., were found to be of pollenizing value.

Further work was carried on in the hope that a variety valuable as a pollenizer and at the same time a marketable cherry that would bring as high a price as the Royal Anne would be brought to light. A variety fulfilling these conditions has been found, as the wide awake cherry grower knows. This variety is known as the "Long Stemmed" Waterhouse. Whence came this "life saver" of the cherry industry?

In the early '70s a seedling of the Royal Anne bore fruit on the grounds of Judge Waterhouse at Monmouth, Oregon. As it had the characteristics of a desirable variety, it was propagated and named Waterhouse. Some of our best authorities and cherry growers claim that this is not the Waterhouse that is known for its pollenization value. It has no value as a pollenizer and is mentioned here only as a matter of information. The Waterhouse that is of particular interest to the cherry grower is designated as the "Long Stemmed Waterhouse." The name Waterhouse was most likely attached to it because of its similarity to the Waterhouse growing on the grounds of Judge Waterhouse. The Long Stemmed Waterhouse besides having a long stem has a larger pit than the Royal Anne, is softer of flesh, and is somewhat pointed; otherwise, is similar to the Royal Anne, being impossible to identify when they are in the canned state except that the Waterhouse has a larger pit. (Future reference to the Waterhouse applies to the Long Stem Waterhouse.)

The Waterhouse probably originated in the vicinity of Salem, Oregon. At any rate, it was grown in a cherry orchard at that place unknown to the cherry grower himself. While this grower was aware that there was a difference in the cherries in his orchard, he did not know at that time that his large crops were due to the pollenizing effects of the Waterhouse, which it proved to be. This variety is a more vigorous grower than its probable parent, the Royal Anne. Scions from this orchard were used in budding and grafting nursery trees and were naturally sold as Royal Annes. Since the scions were taken from both Royal Annes and Waterhouse, most of the trees sold were Waterhouse, due to the fact that more scion wood was available from the Waterhouse than Royal Annes because of their more vigorous growth, the two varieties being about equal in number in this orchard. The interesting fact in this

connection, is that all orchards set out with trees from this nursery have been heavy bearers, and we now know that the Waterhouse was responsible. Thus, the reason for the heavy crops of many of the small orchards and "back yard trees" was determined. In all cases, pollenizers, either seedlings of pollenizing value, or of certain named varieties, some of commercial importance and some not, were responsible. Some of these seedling trees and named varieties have been found to be of more value than others; this being determined by the set of fruit on the near-by self sterile varieties. There are certain seedlings that are excellent pollenizers. There are numerous edible varieties such as Black Republican, that are good pollenizers. In fact, great numbers of Black Republicans were grafted into non-productive orchards a few years back. Under certain conditions these grafts have given good results. The Black Republican, however, is not uniformly a good pollenizer because of the fact that nearly all sweet, black, small cherries are generally called Black Republicans, these different strains of blacks not having the same value as pollenizers.

With the Black Republican, as well as with the seedling, we have a tree which bears a heavy crop, but one which in the case of the seedling is worthless and in the case of the Black Republican is a second class cherry and, therefore, not a profitable one to raise except for its pollenizing value. The pollenizer is the most valuable tree in the orchard, so even if the pollenizer does not produce commercial fruit, the space taken up by it is well occupied. Fortunately, we have a cherry that is both an excellent pollenizer and a profitable market variety. This variety, which is the Waterhouse, before mentioned, and should be the only one planted or top worked as a pollenizer, at least under Oregon conditions.

In 1918, Black Republicans sold for 4c to 5c a pound. Waterhouse sold from 6½c to 8c, the same price as Royal Annes. There is no reason why the Waterhouse should sell for less than the Royal Anne, according to one prominent canneryman. Another point in favor of the Waterhouse is that it makes a larger tree and produces a heavier crop than the Royal Anne.

The Waterhouse is uniformly the best pollenizer for the sweet cherry. There is a mistaken impression among some cherry growers and nurserymen that black cherries should have a black cherry as a pollenizer. This is not so. There is no better pollenizer than the Waterhouse. It is not unusual for a 9 to 11 year old Royal Anne or Lambert tree growing along side of a Waterhouse to produce 300 pounds of fruit and the Waterhouse

tree itself producing over 300 pounds. If a tree of that age is not producing over 100 pounds there is something wrong, either a lack of a pollinizer or a lack of a pollen carrying agent, namely, bees.

What method of procedure must we follow to introduce the pollinizer into the orchard, and how far apart should the pollinizer be? In orchards already established the trees must either be budded or grafted. If the trees are under six years they may be budded. The cherry tree buds very readily. It may also be grafted at that age, grafting into one year old wood, using a whip graft. If the trees are eight years or older a cleft graft would be preferable, not cutting into larger than three-inch wood, as it will take longer for the graft union to heal over. If the tree is an old one a few small limbs should be left to take up the surplus sap, which might otherwise drown the grafts. It might be well to paint a band of tanglefoot around the trunk to prevent ants from crawling up the tree. The ants herd aphids in the tree like they were a bunch of goats and usually select tender grafts for their pasture. Should the grafts become infested with aphids they will make very little growth that season. Vigorous trees only should be grafted; grafts will not grow on a

gumosis infested tree. In three years' time the tree will have formed a new top, that is, a top which will produce an abundance of blossoms. As to the distance apart that the pollinizers should be, it would not be safe to have any self-sterile tree further than 75 feet from a pollinizer, as the yield rapidly falls off where the trees are at a greater distance. Some growers have made it a practice to graft but one limb in a tree. It is a mistake not to graft over the whole tree, with the exception of a few small limbs, because if only one or two limbs are grafted, the resulting growth will be very disappointing. A single graft of this nature stands no chance of getting its share of sap so does not make a growth of over a foot or so when it should grow three to five feet. If the varieties are mixed in the picking box the fruit stands a chance of being rejected by the canneryman. If the whole tree is Waterhouse there will be no chance of mixing the varieties.

Needless to say, bees in abundance should be a part of every orchard. Enough bees should be provided to be able to pollinize the whole orchard in a few hours, if necessary, for during rainy springs there may not be more than a few hours of sunny weather in which the bees can carry on their important work.

ceptible than Jonathan was borne out by infections. Soil on which the experiment had been carried on had had infected trees in before, so that the bacteria which spread the disease were present in the soil. Some trees of each variety, free from infection, were planted, and investigation showed that 62 per cent of the wealthy became infected while only 12 per cent of the Jonathan succumbed.

Trees can recover from crown gall, but of course are stunted from being held back by the disease. From those trees that were infected when planted, it was found that 81 per cent of the Wealthy had thrown off the disease in five years, while 31 per cent of the Jonathan had recovered. This goes further to prove the greater hardiness of the latter variety.

Effects of Galls.

Galls were found to be of two varieties, the hard gall and the soft gall. The hard gall is woody, and seems more like a dead body, as if the gall were dead or lying dormant, while the soft gall or hairy root, is a more lively body and seems to be more actively growing. Perhaps the fact that of the infected Jonathans that recovered, 36 per cent of the Jonathans were of the hard galls and only 29 per cent of the soft, may indicate a more active growth in case of the soft galls.

This hairy root, a form of soft gall, is peculiar. When a tree is planted out, it seems to make a good growth, due to the large number of sap roots which are put out from the gall. However, if the gall is located in a position as to directly interfere with the flow of sap, it will later stunt the tree.

Galls act on trees by interfering with sap flow. In this manner, a gall on the main root is more serious and more of a detriment than one on some side roots or secondary feeders. When the sap flow is cut off, the tree is stunted as was shown in the experiment by reduction in twig growth and growth of trunk diameter.

Our grandfathers used to girdle or partially cut off the sap flow of the trees to throw them into fruitfulness. Crown gall does the same in a modified way, thus throwing the infected trees into fruitfulness early. This was shown by the fact that in five years, those trees which were known to have been infected, showed blossoms and fruit spurs while normal trees were still making their younger growth.

Galls that were formed on stock and union seemed to be equally harmful, being both on main feeding portions of the tree. Galls on secondary roots naturally seemed to be less harmful than those on main roots.

The experiment as carried on at Shenandoah, of course, has not had time to run to trees of bearing age, but does cover that kind of stock which would be planted out by the orchardist or grown by the nurseryman. Crown gall is dangerous. It is quarantined from interstate shipment in

Continued on page 24.

The Fatality of Crown Gall in Apple Orchards

By J. M. Van Houten, Iowa State College of Agriculture

IF you were building a house to live in for forty years, would you build it of plaster or bricks? Would you situate it in the valley near the floods or on the proverbial rock, high and dry?

In a similar way, if you were planting out an orchard, would you plant one comparable to the plaster, that would stand up only a few years, or would you make one like the brick, to last for a long time?

Crown gall has been known for a long time but its injury to apple trees has not been known for long and what is known now is still more or less vague. Back in 1910, at the convention of the National Nurserymen's Association held in Denver, members of that body became agitated in regard to the amount of damage caused by this growth and appointed a committee for investigational purposes. Mr. E. S. Welch, president of the Mount Arbor Nurseries of Shenandoah, Iowa, happened to be a member of this committee.

By securing co-operation of authorities at the Iowa Experiment Station at Ames, he has carried on experiments at his place which when finished, will no doubt be of great value to orchardists as well as nurserymen.

In the spring of 1912, the first planting, consisting of 310 trees affected with crown gall and 246 normal trees, was made. There were two varieties, Jonathan and Wealthy, there finally

being 200 of the latter infected and 210 of the former, their totals being 326 and 330, respectively.

It seems strange that crown gall infected apple trees showed more life than those that were supposed to be healthy, but such was true, for at the end of five years, more of the infected trees were alive than the normal ones. However, conclusions cannot satisfactorily be drawn from this, for in the severe winter of 1916-1917, the stand of infected trees was reduced to 91 per cent while 95 per cent of those trees in the healthy block were still standing. Perhaps the more satisfactory conclusion might be drawn from the latter fact.

Different varieties of apples have been known to vary in susceptibility to disease. The same is true of crown gall. While the experiment itself established conclusively the fact that Wealthy is more susceptible than Jonathan, it has been generally recognized that hardier varieties are more seriously affected with crown gall. Take such varieties as the Patten Greening, Brilliant, Okabena, Eastman, Anisin, Wolf River, Tolman, Sops of Wine, the Ben Davis group, Winesap and Jonathan and Wealthy as well, are known to be particularly susceptible to crown gall. Other varieties as Duchess of Oldenberg or Hibernial are seldom infected with the disease. The various varieties of crab are heavily struck.

The fact that Wealthy is more sus-

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Points On the Art of Top Working Fruit Trees

By W. S. Brown, Professor of Pomology, Oregon Agricultural College

REASONS for top working: Fruit trees are top worked usually for one or more of the following reasons: To change from unsuitable to desirable varieties. To place weak-growing wood of certain varieties upon strong stock. To work over seedlings or varieties that are immune to certain diseases. To shape over an old tree top or to fill in after accident. To provide for cross-pollination in an orchard.

Description of Top Working.

Trees may be budded in the summer as soon as mature wood and good plump buds are available. The peach may be worked over in this way about midsummer, the cherry a little later, the apple and pear in the latter part of August or the first part of September. The equipment for budding consists of a knife with a sharp blade rounded at the point and sometimes fitted with a horn scapel at the other end of the handle

for lifting the lid of the cut, before the bud is inserted. Besides the knife, one needs strands of raffia cut in proper lengths for tying and thoroughly moistened. Limbs or "bud sticks" from trees of the variety desired are taken to the field in wet gunny sacks and kept thoroughly moistened. All bud sticks should have their leaves cut off, leaving the leaf stems in place.

The act of budding, when understood, is a simple one. It consists first in choosing a point on the branch where the new bud when set will have a good opportunity for growth and will grow in the right direction to shape the tree properly, etc. Then a T cut is made in this branch. The downward cut or stem of the T is made first. Then the transverse cut is made by holding the knife blade at a slight angle in order to lift the bark when this cut goes across the stem of the T. Next, if it is necessary, the bark is lifted somewhat to

allow the bud to slip into place. The bud stick should then be taken and one of the buds removed carefully with a knife. This is done by starting the cut from one-third to a half inch above the bud and cutting carefully underneath the bud, including some of the wood, and coming out about one-half inch below the bud. With the stem as a handle, the bud can be taken and pushed gently down into the T cut made on the branch. When the bud is solidly in place, the upper portion of the bud wood should be cut off transversely so that the wood will fit down tightly upon the stock. The stock is then wrapped carefully with raffia, beginning below the bud at the bottom of the T cut and working upward, taking care not to cover the bud itself, but wrapping securely about the top of the T. A good square knot, drawn tight, should be used. As soon as the bud has "stuck," which will usually be in about two weeks, the raffia should be cut in order that it may not girdle the branch and kill the bud.

Spring budding is often done soon after the sap has begun to flow by using buds from sticks cut and kept in a dormant condition until time of setting.

When it is desired to work over apple or pear wood two or three years of age, whip grafting is frequently used. Whip grafting is performed by making a smooth and straight diagonal cut across the branch to be grafted. Then a split of about an inch down through the center of the limb completes the cutting. The scion to be grafted upon this branch should be of last year's wood, cut when the buds are entirely dormant and prepared for grafting by making a diagonal cut similar to the cut made on the stock. The stock and scion should be carefully fitted together, so that the cambium layers of the stock and scion may coincide at least upon one side. Unless the cambium layers touch at some point the graft will not be successful. Two or three buds are left upon the scion. Finally the scion is either waxed carefully or is wrapped with waxed muslin or waxed string. This grafting may be done in the early spring from a time shortly before the sap begins to flow until the buds have begun to open.

Large Trees.

Often it becomes necessary to work over an old tree in order to change the variety or to fill in the top after some accident. A sleet or snow storm may have taken a valuable limb out of the top. Grafting is the only way by which this condition can be remedied.

On the large trees budding is very seldom used. Here and there on a one-year-old sucker or limb, budding may be used to try out a new variety or for purposes of cross-pollination.

Cleft and bark grafting are the methods used for top working pome and stone fruits. The cleft graft is more popular for the apple and pear, while the bark graft is used more frequently for the stone fruits, except peaches. The apple and pear lend themselves best to cleft grafting because the wood is so

Continued on page 21.

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Comparative Efficiency of the Spray Gun

By Prof. R. B. Cruickshank, Experiment Station, Ohio State University.

PERHAPS the one outstanding saving effected during the past season was by the use of the spray gun. The spray gun happened in the nick of time and proved to be a godsend to the hard-pressed grower who had sufficient pioneering spirit to buy one even in the face of what seemed to be a big price. The spray gun has definitely proven its value, to the fruit grower with a power sprayer, in three fundamental ways—in the saving of time, in the saving of labor, and in the saving of spray material.

People are usually slow to adopt new practices, especially when those practices are opposed to current conception, but the spray gun has been taken up by growers all over the country in a brief time. It came, it was seen, it conquered.

Of course, doubts and objections were advanced. In the first place, some said that it could not do the amount and quantity of the work claimed for it. It sounded too good.

One objection raised was that it would not force the spray into the calyx at the time of the first coddling moth application. We had been using angle nozzles and laboring under the supposition that the material must be sprayed into the blossom cup with considerable force. Probably that is correct with the ordinary nozzle, but the spray gun seems able to diffuse such a fog of spray throughout the tree that plenty of poison is lodged in the place where it will be most unhealthy for the apple-worm. Answers to a questionnaire which I addressed to a large number of growers recently were practically unanimous in that they had fewer worms than usual.

Another point of practicability raised was the possible injury to the fruit and leaves, due to very high pressure used. There have been but few instances of any such injury, and in all cases this has been traced to the fact that the gun was held close up and the spray dashed into the foliage on "high." If the operator is working rapidly and does not care to shut off the gun too much, he should endeavor to spray the lower side of the tree at some distance, gradually going higher as he approaches the tree.

The matter of the amount of spray has also been answered in a way complimentary to the spray gun. Except in the early work before a man becomes accustomed to it, the usual answer is that the gun uses less material than the nozzles. Some growers have experienced an economy in spraying even fairly small trees.

I believe that where lack of control of orchard pests has been experienced, the cause may be assigned to application at a time just aside from the critical one, to the use of too low a pressure or to lack of thoroughness on the part of the operator. All these

apply equally to the rod and nozzle. The great danger in the use of the spray gun verily appears in its great capacity. It may lead men to an undue elation and an unconscious carelessness, resulting in the trees getting the proverbial "lick and a promise." I have found but two men in Ohio who, after a fair trial of the gun, are willing to go back to the rod and nozzle. The first man's reason was that "he couldn't work fast enough to keep up with the gun"; and the second one's was that "the spray men could not keep from getting themselves drenched and so preferred the long rods." In opposition to this objection most men have found that it was easier to keep out of the mist.

The spray gun is efficient only as an accessory to a power outfit that is capable of maintaining about 200 pounds pressure. Some men use them with less, most men prefer more.

This immediately brings up the question of the power sprayer to the man who does not possess one. We believe in Ohio that a man who has as few as five acres of orchard can afford to buy a power outfit. I have known men to make them pay and pay well on three acres. The introduction of the spray gun has added another argument for the power sprayer. In comparison with a barrel outfit, the power sprayer is more rapid, more efficient, a saver of time, temper, labor, and material. The man who is still handicapping himself with a barrel sprayer has no cause to complain about the scarcity or high price of labor. For him the power sprayer offers a definite economy.

The tendency even in the hilliest of orchard sections is toward the larger and more powerful machines. If there is a question as to the advisability of buying a duplex or a triplex machine, it should be well considered before choosing the lighter one.

Cherries by Parcel Post

During the season, says the Payette Independent, it was learned that at a town up the road a grocery store was selling sweet cherries at retail at 20 cents per pound. The dealer was asked if he could use some cherries of the same varieties at 10 cents per pound, and he said he could not. Developments: H. Harland inserted a small ad. in the local paper of the town offering to deliver, by parcel post, cherries in 20-pound crates at \$2.00 and \$2.50 each per crate. Mr. Harland has been busy filling the orders that have come in. A decent profit on fruit raised in Payette Valley, a fair rate of transportation and the distribution would be such that all the fruit would find a welcome in homes of people wanting it, but who are prohibited too often from having it because of the middle man's large percentage of profit and big transportation charges.

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For sale, 18 acres, of which 10 acres are in apples, 10 years old; $\frac{3}{4}$ Yellow Newtowns, balance Grimes Golden, Winter Banana and Yellow Transparent; some pears, peaches, cherries and small fruits. Four-room bungalow, good barn, 4 chicken houses, good well. Four miles from Corvallis on Philomath (hard) road; $\frac{1}{2}$ mile to school. Price \$9,000, half cash. Address

Box 782, Roundup, Montana

THE SELF-OILING WINDMILL

has become so popular in its first four years that thousands have been called for to replace, on their old towers, other makes of mills, and to replace, at small cost, the gearing of the earlier Aermotors, making them self-oiling. Its enclosed motor keeps in the oil and keeps out dust and rain. The Splash Oiling System constantly floods every bearing with oil, preventing wear and enabling the mill to pump in the lightest breeze. The oil supply is renewed once a year. Double Gears are used, each carrying half the load. We make Gasoline Engines, Pumps, Tanks, Water Supply Goods and Steel Frame Saws. Write **AERMOTOR CO., 2500 Twelfth St., Chicago**



Plans Shipping Export Apples Through Canal

CHARLES M. SIMONS of London, connected with the firm of Simons, Shuttleworth & Co., British apple and pear exporters, who have places of business in London, Liverpool, Glasgow and also in New York and Boston, who was in Portland recently and talked to a representative of BETTER FRUIT, says that the time has arrived when Pacific Northwest apples and pears should be shipped under refrigeration in ships direct from Pacific coast ports to England.

Simons, who is making a tour of all the Pacific Northwest fruitgrowing districts, including California, says that

other English firms that are handling fruits from this section of the country are joining with his firm in this opinion and that a movement has been started to bring the matter to a successful issue.

The plan as announced by Simons is to secure from the American government, if possible, the use of a dozen ships that are now under the control of the shipping board and that have refrigerating plants and have them make regular runs via the Panama Canal from Portland, Seattle and San Francisco to English ports.

The apple tonnage for export in the Northwest, Simons says, will be so large in a year or two that it should provide a highly remunerative business for refrigerator ships, in addition to the fact that this method of transportation will be much quicker than the present one of shipping across the continent by railroad and reloading on the Atlantic coast. The fruit, he says, will arrive in England in much better condition and at a lessened transportation charge.

To secure a concerted movement, Simons is taking it up with shippers in each of the apple raising districts of the Northwest, as well as with the business organizations in the cities of Portland, San Francisco and Seattle, and on his return to New York is to have a conference with several large shipowners as well as officials, who will ask the shipping board to provide vessels.



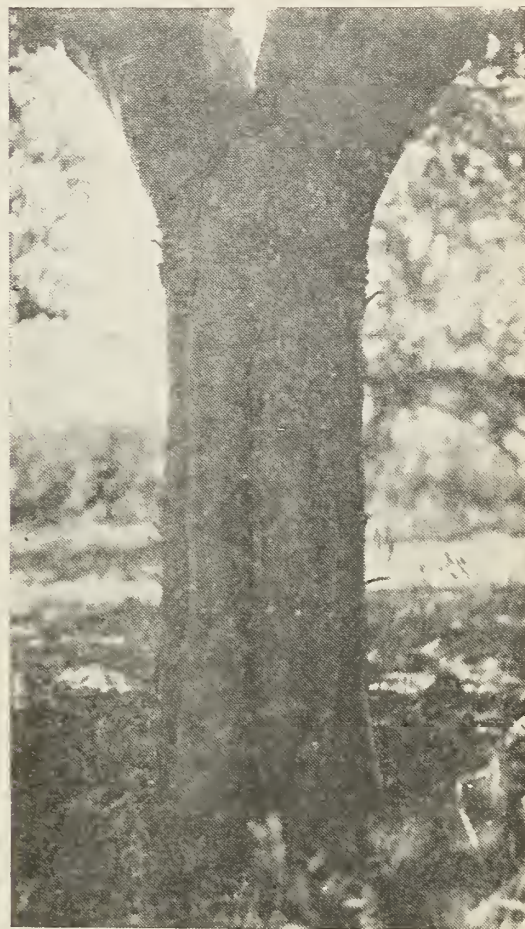
CHARLES M. SIMONS
OF LONDON, ENGLAND

Mr. Simons, who is connected with several of the largest apple importing firms in the British Isles, has recently been making a tour of the Northwest apple growing districts advocating the shipping of boxed apples direct to England through the Panama Canal.

\$200 from One Fig Free

A single tree of Capri figs, situated in an orange orchard at Portersville, California, purchased recently by the Rev. A. H. Zahl, retired pastor of the Emmanuel Evangelical church, netted the owner \$200 in one season, it became known recently. Rev. Zahl discovered the tree situated in a corner of the orchard and covered with the Capri wasp, necessary for the pollination of the fig. He later secured a crop of 2000 pounds from the tree, which he sold for ten cents a pound.

A union between the graft and the tree will then take place and the injured part will be bridged over. In very bad cases of injury it may be necessary to fasten the lower end of the graft into one of the tree roots. Place a graft every two inches across the injured part.



A FINE EXAMPLE OF BRIDGE GRAFTING

The apple tree shown in this illustration was frozen four years ago and the trunk split open. A scion was cut and grafted in from bark to bark along the break, with the result that the tree is today in fine condition. By splitting the bark on this graft at the sides it will eventually seal up with the trunk and in a few years it will be difficult to perceive that a graft has been set in.

Saving Injured Fruit Trees by Bridge Grafting

VALUABLE fruit trees are often so seriously injured by splitting or being gnawed by mice and rabbits who eat the bark and sapwood at the surface of the ground that they die unless aided by tree surgery. The remedy to be supplied in this case is bridge graft-

ing. In order to apply this remedy you should first trim off the gnawed parts of the bark or the bark on the edges of the split with a sharp knife leaving the edges smooth. Then take a twig or scion of last summer's growth about as thick as a lead pencil and long enough to extend an inch and one-half above and below the gnawed part. Both above and below the part to be grafted, cut out a strip of bark an inch and a half long and as wide as the twig or graft is thick. Trim both ends of the graft on the same side by paring it down to about half its thickness for a length of about two inches and then fit the prepared ends into the bark cuts above and below the injury. Fasten each end of the graft to the tree by driving in a very fine tack or brad not much thicker than a pin. Cover the ends of the graft and all cut surfaces with grafting wax.

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SPECIALTIES

Apples, Peaches, Pears and Cantaloupes

YAKIMA, WASHINGTON

BETTER FRUIT

An Illustrated Magazine Devoted to the Interests
of Modern Fruit Growing and Marketing.
Published Monthly
by

Better Fruit Publishing Company

703 Oregonian Building
PORTLAND, OREGON

Restrictions on Storing Apples.

The restrictions that the Department of Justice is reported to be contemplating on the storing of apples are not only unwarranted, but unjust in view of the fact that apples are distinctly a perishable product. Even in the best of storage they will not keep only for a short period compared to other food products.

The statement attributed to the Department of Justice is to the effect that it "will permit the storage of apples where it is shown that the same is in line with normal business, or according to the practice of previous years," but that "it will be considered as unfair practice if it is shown that apples are stored with the idea in mind of holding for higher prices."

This ruling has called forth a protest from Eastern growers who say that if it means that apples cannot be sold out of storage at prices higher than the average out-of-orchard prices great injustice will be done the growers as well as the storage plants. With the latter interpretation of the ruling in effect it is feared that a glut in the market would ensue early in the season which would be disastrous to both grower and buyer.

With so many flagrant instances of the hoarding of foods that are not of the perishable nature of fruits, it would seem that the Department of Justice could utilize its authority and energies to better advantage than in attempting to hurt an industry that largely depends for its success on proper storage methods. In fact, fruit is one of the products in which there has been little juggling to obtain high prices through cold storage methods. With a much larger tonnage arriving at the distributing points than the demand called for it has been imperative to place apples and other fruits in storage until such time as the market was ready for them.

Therefore, if the regulations in regard to storing apples are so designed so as to interfere with this practice they should be modified.

Shipping Export Apples Direct.

Now that shipping is resuming to some extent its normal tone the question of shipping Northwest apples for the export trade direct via the Panama Canal is again coming to the fore. The matter at the present time is being taken up by English apple importers who look upon this method as being the ideal way to ship fruit from the Pacific Coast to Europe; and it is the ideal way. With sufficient tonnage to keep a number of refrigerator ships engaged in this trade during the shipping season the fruit should be transported more quickly, more cheaply and arrive at its European destination in better condition.

To secure this result, however, it will

be necessary for the entire Northwest apple growing sections to combine in a concerted movement. One or several districts do not furnish enough export apples to make the venture pay. All of the districts do furnish or will furnish enough tonnage in a year or two and the time to commence the movement and bring it to a successful conclusion is now.

Maintaining Soil Fertility.

The time is fast approaching when America will adopt the methods of maintaining soil fertility that have been practiced by agriculturists in Europe for many years—that is putting back into the soil as much substance as is yearly drawn from it. Quite a long step in this direction is already being made in this country, but a still longer and faster one must be made to catch up with impending conditions. For many years the rich virgin soils in many parts of the United States have withstood annual or semi-annual cropping. This condition, however, is waning and from all sections of the country where crops are grown come reports of the need of re-fertilization.

The encouraging fact in this situation is that this need is being realized by intelligent farmers and orchardists and that they are taking up systematic methods to take care of a possible soil exhaustion. As has been well said, the latter day agriculturist is now farming with his head as well as his hands and is getting better and more stable results. The soil is like anything else, if you keep taking from it and giving nothing back you will eventually have nothing left. Give to your soil and give willingly and it will, with proper care, yield rich returns.

The Increasing Consumption of Fruit

It is said by authorities on the matter that the consumption of fruits and nuts in the United States is greatly on the increase. The reason assigned for this is that the American housewife no longer regard fruits and nuts as a luxury, but as a necessity to be used in the daily diet if possible, on account of their health-making qualities. The truth of the latter statement is borne out by the advice of the medical fraternity who have long and diligently urged an American diet that would include more fruit and vegetables and less meat and pastry.

There are other things, however, that have had their influence in increasing the demand for fruit, two of which were the canning campaign waged by the government during the war and which taught thousands of housewives who had never canned before how to can and the educational campaigns that have been carried on by the large fruit-growing and fruit handling concerns showing the healthfulness of fruit and how to cook and serve it. Due to these facts the fruit tree in the back yard that was formerly looked upon as an incident is now regarded as a distinct asset to be carefully taken care of, and the city matron is as active during the canning season as her country-bred sister.

To Patrons of Better Fruit:

Owing to increased cost of production and the continued high postal rates the management of Better Fruit finds it necessary to raise the subscription price of this magazine to \$2.00 after December 1, 1919. Until then subscriptions will be taken at the old rates, viz:

In United States and possessions—	
1 year	\$1.00
3 years	2.00
In Canada—	
1 year	\$1.50
In Foreign Countries—	
1 year	\$1.50

By renewing your subscription now or becoming a new subscriber you will get the benefit of the present rate.

A return blank allowing you to take advantage of this special offer will be found on page 1 this issue.

Better Fruit Publishing Co.

Editorial Comment.

From all indications an automobile, a motor truck and a tractor is the program soon to be adopted by the successful orchardist.

Cull apples are really worth while this year. Both the "drys" and the "wets" want them. The former for drying and the latter for cider.

Orchards in Berkeley county, West Virginia, recently sold at values of \$1000 to \$400 per acre. West Virginia is evidently getting into the Northwest class when it comes to raising apples on a commercial basis.

The September apple crop report of the Bureau of Crop Estimates shows a slight improvement in apple crop conditions in some of the Eastern states, while conditions in the Northwest are shown to be fully up to early forecasts—the largest of any one section in the United States.

As an illustration of the need for advertising as a factor in the exploitation of a given food product, Mr. Dunlap of the California Prune and Apricot Growers, Inc., cited the following humorous story at the Riverside Convention: A grower sent his wife's sister in Texas a 25-pound box of prunes and received the following acknowledgment: "The prunes arrived in fine shape and are mighty nice to eat, but they don't fry very well." This recalls the sailor lad in the old wooden-ship days, who sent his mother in Bedford a chest of tea from a China port. She cooked the tea with bacon and, calling in her friends, served it as "greens." All of which causes the remark that judicious advertising is the red blood of industry.

Salem is to be made the dehydration center of the United States and an advertising appropriation of \$250,000 has been made to tell the world about it. It is already the great and only loganberry juice center, and its fruit cannery output is not exceeded on the Coast, while the organization of fruit growers, recently perfected, will make it the greatest prune market in this country. All of which indicates that the Capital City of Oregon is getting ready to go some in the near future.—*Daily Capital Journal*.

Timely Topice and Advice for the Fruit Grower

Notwithstanding the oft repeated advice in regard to spraying, many orchardists fail to provide correct spraying outfits and give attention to the proper methods of spraying their orchards. A neglected or poorly sprayed orchard becomes an incubator for insect pests and plant diseases; a menace to the orchard of a careful neighbor, and loses money for its owner. If nothing else is done to an orchard, it ought to be thoroughly sprayed.

Any system of tenantry on an orchard which results in the depreciation of the soil will eventually have to be abandoned, and it is safe to say that any form of tenure will not be permitted in the future which does not insure the highest possible production permanently. It is well said, that of all forms of conservation, conservation of the soil is the most important.

Cranberries are usually grown on reclaimed salt marshes but will not be a success in such locations until dykes are constructed which prevent the flooding with salt water. In order to put the bog in condition for planting sufficient time must elapse to wash out the salt, as the plants will stand only a limited amount of saline matter. Salt marshes treated with fresh water flooding develop into fine cranberry land, provided the soil matter is of the correct nature.

Quack tree doctors are said to be working on the Coast and a warning is issued to orchardists to be beware of their operations. Federal inspectors have recently seized several shipments of concoctions which were being sold on the Pacific Coast as cures for all the ills of trees; therefore, fight shy of the tramp tree physician.

According to Prof. T. J. Headlee, experiments show that the most practical method of controlling appleaphids consists of the application of winter strength lime-sulphur, to which 40 per cent nicotine has been added at the rate of 1:500, during the green bud stage. At this time the maximum number of lice will be hatched and will be killed by the nicotine, and the unhatched eggs will be in their most sensitive state and will be destroyed by the mixture.

Fads and fallacies, says the California Agricultural Bulletin, are sometimes exploited in the columns of rural publications, and they frequently deceive those who are inexperienced in horticulture or farming. It is well to look askance upon some of the theories and alleged experiences which are related by people whose fanciful and romantic conception fit them better for fiction than farming. When we read of the staggering crops of Phenomenal Phodder Plants, Spineless Gooseberries or Miracle

Melons, it is well to turn to the advertising pages and see who has offered these promising introductions for sale. This is not written to decry or discourage new productions or condemn everything new, but as a warning to go slow in accepting as gospel truth everything written by the amateur plant wizard who may sign himself Horticola, Agricola or Cococola. It is best to try new introductions furnished by reliable and well known seed houses or nurseries which have carefully tested what they recommend, and then to consider if it is actually adapted to the situation where it is to be tried.

What They Are Doing in California

An experimental drier for the purpose of effecting a method of saving the California wine grape crop was installed recently at Davis by the State Department of Agriculture. Experiments in drying wine grapes in the sun are also being gone into for the purpose of turning them into raisins as well as a method that will allow them to be cured and shipped out of the United States for the making of wine.

It is reported that the majority of growers, packers and fruit handlers in California see in the new state standardization law a means of bringing the fruit industry of that state to a much higher level. While some resentment is being shown by a small percentage of those interested, the great majority of the growers are loyally cooperating with the state department of agriculture in enforcing and observing the law.

Dr. S. I. Kuwana, entomologist for Japan, arrived in Sacramento recently. Dr. Kuwana brought with him a number of beneficial parasites of the Japanese mealybug.

A better article of dried peaches is the aim of the California Peach Growers' Association. The peach growers' association will adopt the plan of the apricot growers in improving their output and advertising it to the consumer.

California is adopting the plan of turning over to the charitable institutions of the state fruit that has been condemned as unfit for the public markets.

During the height of the grape shipping season nearly 200 carloads a day were shipped from Lodi.

A Clovis woman who started putting up a fancy pack of figs and nuts four years ago is now operating a big brick warehouse in which 25 people are employed to handle the output, which this year will total about 25 tons. The first year she shipped only 250 pounds.

R. L. Nougaret was recently appointed by Director Hecke to take charge of the Viticultural office of the new Department of Agriculture. Mr. Nougaret has had a wide experience in this line and is looked upon as a very valuable addition to the staff of the department.

The experiment of shipping ladybugs to Modesto from Tuolumne county will be tried for commercial purposes the latter part of this week, when four sacks will arrive for distribution to bean growers at \$2.75 per sack. If the bugs are in good condition, arrangements will be made for shipments in larger lots. Assistant Farm Adviser Roy D. McCallum returned from the strawberry section last week, after having arranged with George Conlin to ship ladybugs to Stanislaus farmers. He also brought back 3½ sacks of bugs, which will be distributed in the bean fields where the black aphids are numerous. McCallum inspected a number of fields where the bugs were used and found the aphids completely destroyed. About a sack and a half to five acres are required to combat the pests.

California is rapidly becoming the "greatest home in the world for peaches," according to a statement made at Riverside by Homer B. Fairchild, promological expert with the Department of Agriculture, at Washington, D. C. "The peach crop of America this year will not be more than 30,000,000 bushels," said Mr. Fairchild, "and of that amount California will produce 16,000,000 bushels. What with peach yellows and curly leaf, Delaware, Michigan, Ohio and parts of Indiana and New Jersey will not have a quarter of the crops they used to have, while California has an immense field and the demand is proportionately large. Every dollar California has spent vanquishing horticultural diseases and insect pests will return ten-fold, and then some. In ten years the crop of Georgia has fallen from 4,200,000 to 2,700,000 bushels, all because of the yellows which have slowly sapped the life out of the trees. It is almost the same in Virginia. California is more nearly free of peach tree diseases than any other state in the Union."

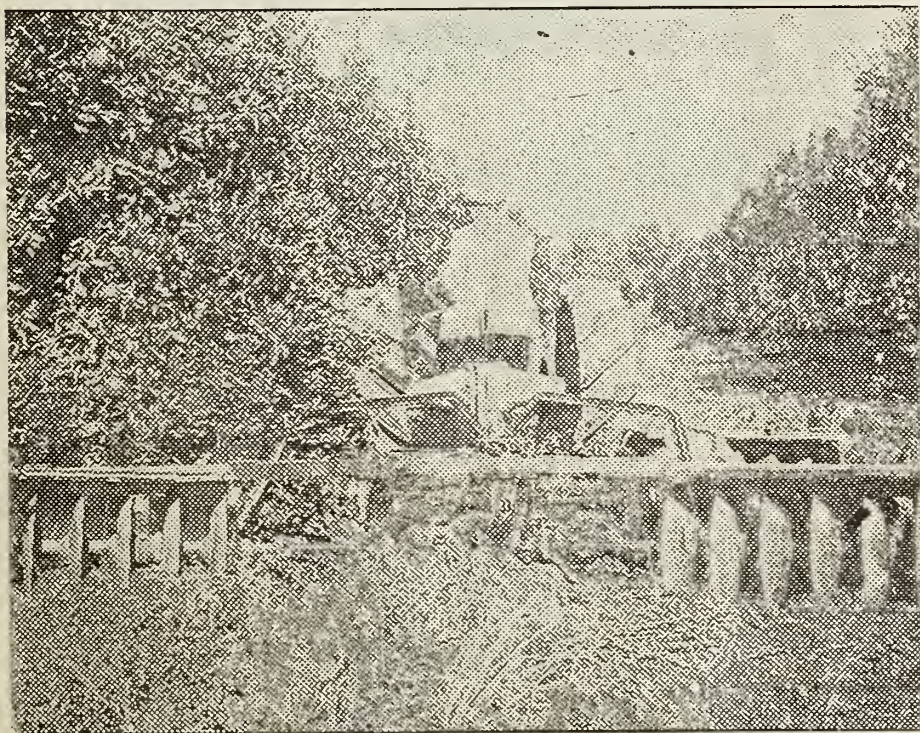
The American Fruit Growers, Inc., recently absorbed the American Fruit Distributors, a \$50,000,000 corporation doing business in Southern California. It is expected that Brawley will be the headquarters of this new branch of the organization.

Nursery stock in California is reported to be almost as short as it is elsewhere and peach trees are quoted at 40 cents apiece for 1 or 1,000. Grape cuttings have risen in price from \$10 to \$30 and \$35 per thousand.

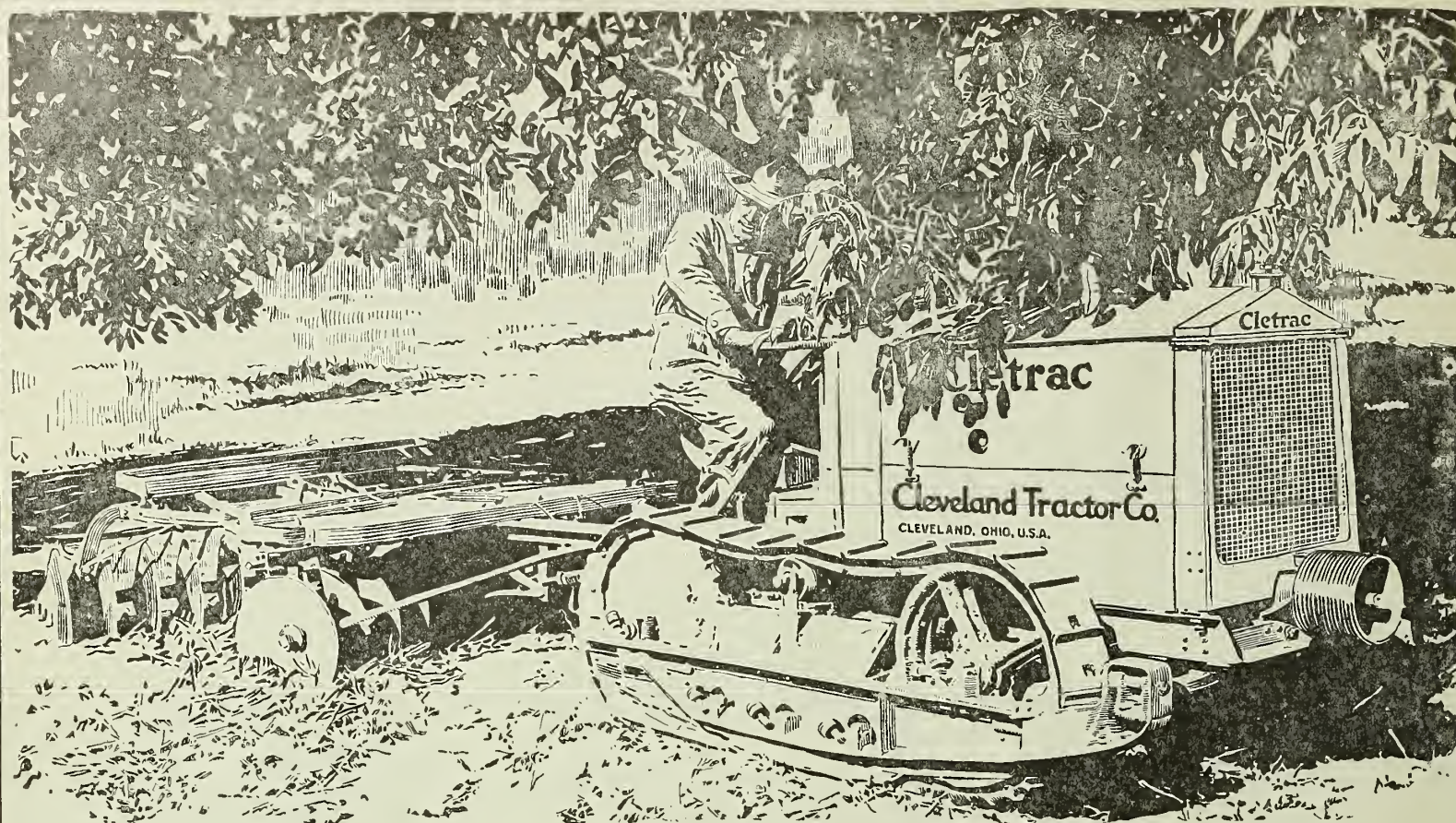
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The Roderick Lean Automatic Orchard Disc, which is attracting a good deal of attention in California, where it is being tried out extensively. In this illustration the disc is being pulled by the Fordson tractor, for which it was designed.



Powerful and Compact

Ideal for Orchard Work

A tractor to be profitable in orchard work must have plenty of power—but it must be a *small* machine, capable of working up close to trees, capable of getting under low hanging branches, capable of turning sharply, capable of good hillside work.

The Cletrac Tank-Type Tractor meets *all* of these requirements—and more.

It is the embodiment of compact power. It is small. It is easy to handle among fruit trees. It turns in little more than its own length. It is ideal for hillside work because of its tank type of construction, which enables it to go practically

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The Cletrac burns kerosene—and is very miserly in the quantity it consumes. Distillate or gasoline can be used equally as well if desired.

“Selecting Your Tractor” is the name of an attractive booklet that every orchard owner should have. It gives a rich fund of information about tractors and their uses. Your copy is ready. Send for it today—or ask the Cletrac dealer for one.

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If you had been one of her proud sailors you would have left New York City in January, been at Guantanamo, Cuba, in February, gone ashore at Port of Spain, Trinidad, in March and stopped at Brest, France, in April to bring the President home. In May the Arizona swung at her anchor in the harbor of Smyrna, Turkey. In June she rested under the shadow of Gibraltar and in July she was back in New York harbor.

Her crew boasts that no millionaire tourist ever globe-trotted like this. There was one period of four weeks in which the crew saw the coasts of North America, South America, Europe, Asia and Africa.

An enlistment in the navy

gives you a chance at the education of travel. Your mind is quickened by contact with new people, new places, new ways of doing things.

Pay begins the day you join. On board ship a man is always learning. There is work to be done and he is taught to do it well. Trade schools develop skill, industry and business ability. Work and play are planned by experts. Thirty days furlough each year with full pay. The food is fine. A full outfit of clothing is provided free. Promotion is unlimited for men of brains. You can enlist for two years and come out broader, stronger, abler. "The Navy made a man of me" is an expression often heard.

Apply at any recruiting station if you are over 17. There you will get full information. If you can't find the recruiting station, ask your Postmaster. He knows.



Shove off!

Join the U. S. Navy

Northwest Fruit Notes from Here and There

OREGON.

Claiming the record for Bartlett pear prices in Oregon, Medford during the month of September reported the sale of a car of Bartletts at \$5.20 per box. Another car from that district sold for \$5.00 per box.

Although the early rains caused some loss to prune growers in the Willamette Valley, the damage was not heavy, and the Oregon prune crop is expected to be very good. Growers have been warned by the prune handling concerns to separate the damaged prunes from the perfect fruit, in order to keep up the grades. The damaged prunes will be marketed separately.

With an addition to their plant costing \$60,000, the Hood River Apple Vinegar Company now has what is said to be the largest and best equipped cider and vinegar making plant on the Pacific Coast.

Ten cars of fresh prunes shipped from the Mosier district, it is reported, will return to prune growers of that section an amount that will give them an average of \$1,000 per acre for their crops. The prunes were sold for \$100 per ton, f. o. b. shipping point. One grower figures his returns from two acres at \$1,100 per acre.

During the month the prices for Oregon apples was generally well maintained, but buying was somewhat less than during the month of August. Sales were reported running from \$2.40 to \$3.75 per box, the latter price being for Delicious.

Prune picking commenced September 15 near Dallas, where the fruit was said to have been practically unhurt by the early rains. The prices for picking were about the same as those paid last year.

Low temperatures prevailed in the Medford district during the early part of September where the pear picking was on in full blast. Later the weather warmed up and the pear harvest went on briskly.

During the past year the King's Products Company distributed \$125,000 in salaries in the Salem district and paid out for products \$525,000.

The annual packing school conducted at Hood River by the Hood River Apple Growers' Association had an initial attendance of 70, the largest number that has ever attended the school on the opening day. A feature of the course were lectures every day on grading and packing apples by experts.

George Sykes, who has spent considerable time studying fruit packs, is this year introducing a new system of packing apples. The apples are laid on cardboard patterns in which slits are cut. The system, it is said, makes a tight pack. It has proven popular with the

trade, in that the apples are immediately on display when the top of the box is removed.

Gervais claims the champion berry picker of that section. Her name is Miss Esther Gleason, and in one day Miss Gleason picked 157 pounds of Evergreen blackberries at 4 cents a pound, netting her \$6.28 for her day's work.

According to Earl Percy, secretary of the Oregon Growers' Cooperative Association, the demand for fruit and nut products is increasing rapidly and the average housewife no longer considers these foods as luxuries. This is said to be particularly true of walnuts which formerly were in demand largely at Christmas time. This is no longer the case and walnuts are now being used very generally throughout the year.

The Himalaya berry is being put forward as a fine berry to grow in Oregon. It is a berry somewhat like the Evergreen blackberry, ripens about the first of August, continues bearing until October, and is a very heavy bearer.

Reports are to the effect that the Flame Tokay grape crop at Grants Pass matured in good shape and that the output will be of fine quality. The first car of Winter Banana apples from the Grants Pass district this year sold for \$3.81 per box on the New York market.

The Multnomah County Fair and Land Products Show, held at Gresham, September 15 to 20, resulted in a good collection of exhibitors of stock, land products and farm implements. The fruit exhibit was somewhat limited owing to the fact that only early apples were available. The racing events were unusually good but the attendance throughout the week was not as large as it should have been.

Hood River held its county and fruit fair September 19 and 20, and many fine exhibits of fruit were on display. In fact, the fruit display was one of the best ever made in the Hood River Valley.

Salem during the past two months is reported by the Daily Capital Journal of that city to have been the reddest, juiciest spot in Oregon. This comment was called forth by the fact that the Phez Company and other plants there were putting up thousands of gallons of loganberry juice and thousands of cases of jams, jellies and cans of small fruits. The Rupert Company also had a very successful season and reports a large output at its various plants.

The Oregon Growers' Association reports a greatly added membership to its ranks during the past month. Wherever meetings have been held many growers have voluntarily joined the association while the propaganda conducted by the association's managers is bringing in others who are not able to attend the meetings.

WASHINGTON.

The Harry Shotwell ranch, near Monitor, has a good example of what can be done in taking care of orchard help during the fruit harvesting season. Mr. Shotwell has erected six small houses, each containing a kitchen and sleeping room, furnished with a bed, stove and other conveniences. These are to be occupied by families who will have charge of the picking and packing of the apples on his twenty-acre orchard.

A Wapato rancher, who recently paid \$19,000 for a fruit ranch, expects to harvest enough fruit from it this year to more than pay the purchase price.

The Puyallup and Sumner Fruit Growers' Association has disposed of 95,000 cases of canned berries this year. The association now has plants at Albany, Oregon, Wenatchee and Chehalis, Washington, in addition to the one at Puyallup.

After being located at Toppenish for 22 years, Richey & Gilbert, the well-known Washington fruitmen, recently moved their headquarters at Yakima, where they have just completed a large and modern warehouse.

According to figures recently published by the government, Grandview will this year produce an apple crop as large as that of several of the New England states combined. The whole state of Ohio this year, it is said, will not produce as many apples as the Grandview section.

A peach measuring 11½ inches in circumference and weighing 1½ pounds was on exhibition recently at Wapato. The peach was sent to Kansas City to be exhibited there.

The harvesting of Selah's Jonathan crop commenced about September 22 and the picking of other varieties was commenced in the early part of October.

The last Bartlett pears to be accepted by shippers under the contracts entered into with the growers were loaded out at Yakima on August 16. A special train of 50 cars was made up and shipped east. This time limit does not apply to Bartletts raised on the hills, which are from ten days to two weeks later than those in the valley proper. About 500 cars of pears will be shipped from the Yakima district this season, totalling in value \$750,000.

Work on the season's run of Bartlett pears began on August 19 at the Libby, McNeill & Libby cannery, when a crew of 300 started. The cannery expects to handle a minimum of 500 boxes daily, and will use 150 tons of pears weekly during the season. Manager R. C. Turvin says the pears were in better condition than he has ever seen them in the Yakima valley, and anticipates no difficulty in having them keep until the end of the run.

An utter collapse of the market for summer fruits was threatened during August because of the shortage of sugar existing throughout the country, according to reports received at Yakima. As a result the price of pears dropped from \$2 to \$1.75, though practically all the crop has been sold. Peaches that were contracted for at \$1 a box early in the season dropped to 50 to 60 cents and buyers were not eager to buy at those prices.

Washington's commercial apple crop this season will total 21,300 cars, an increase of 5,050 cars over the 1918 crop, according to estimates issued recently by the federal bureau of crop estimates. The combined apple tonnage of Idaho, Oregon and Washington is estimated at 30,328 cars, an increase of 11,296 cars over the 1918 yield.

Topping the market for this or any other season, as far as known in the Yakima district, is the price of \$3.25 a box, in the orchard, for 2,500 boxes of Delicious apples reported to be paid to Sanderson Brothers for the fruit in their orchard this season. They sold the entire crop of 25 acres at a price which will bring them \$40,000, the amount they paid for the place when they acquired the ranch five years ago.

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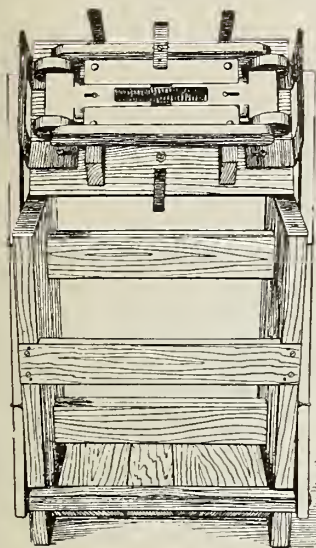
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Conservative estimators are now placing the apple crop to be shipped out of Omak, Wash., this fall and winter at 600,000 packed boxes. This is the basis taken for ordering boxes by the two large shipping organizations.

A market for between 4,000 and 5,000 tons of cull apples will be provided this season by the California Packing Corporation of Yakima, involving a payment of at least \$40,000 to Yakima farmers, according to an announcement made by T. L. Tennant, superintendent.

Alleging that recent advances in wholesale lumber prices have necessitated the move, fruit box manufacturers have advanced prices four cents per box, making the ruling quotation 24 cents each. This is double the figure charged three years ago and ten cents over last year's prices.

At Yakima when the rush of the fruit harvest is under way, a thousand men, women and young people are at work on Produce Row, handling the flood of fruits. Fully 100 cars of pears, soft fruits and mixed produce are rolled out daily during the season and the weekly payrolls totals \$30,000. The row is a mile long and a paved highway, bordered on either side by warehouses, packing plants, evaporators, canneries and cold storage plants.

More than 25 firms have entered the Wenatchee field to handle the 1919 apple crop. The following average prices have been offered for extra fancy grades and are about 50 per cent higher than last year's early quotations: Winesap, \$2; Spitzenberg, \$2.50; Delicious and Winter Banana, \$3 to \$3.25; Jonathan and Rome Beauty, \$2.25; Black Ben, \$2; Ben Davis, \$1.85, and summer apples, \$1.75 a box. Some contracts have been made at \$2.50 for the entire production of the grower on the orchard run basis.

J. C. Lilly, president of the Farmers and Merchants' Bank of Cashmere, reports that a big apple crop in that district is assured and that prices, from present indications will break all records.

Luke Powell, former district horticultural inspector, is reported to have sold his crop of Winter Bananas at \$3 a box, orchard run. The crop is estimated at 4,000 boxes. From his home ranch near Prosser, J. A. Anthon of Grandview is said to have sold his crop of Winter Bananas from 10 acres at the same price.

Ten years ago the Spokane Valley section immediately adjacent to the city of Spokane was a barren waste. Irrigation was introduced and this season the apple production of Spokane Valley is estimated at 600 to 900 cars. Spokane Valley Fruitgrowers' Union, with 225 growers and a fine modern packing plant at Opportunity, employing 125 persons, will ship more than 200,000 boxes. Two-thirds of the crop, 140 cars, has already been sold and in many instances partly paid for. On September 15 the union commenced picking winter Bananas of which 5,000 boxes will be shipped. Pickers started on Wageners on the 22nd inst.

Apples ripened a week to ten days earlier than usual in the Wenatchee district. Winter Bananas and Jonathans have been picked and by September 22 the apple harvest on late varieties was in full swing. The district will ship a solid trainload of fifty refrigerator cars daily if cars are forthcoming. By October 1 this output was doubled. It is estimated that 5,000 persons will be employed in the Wenatchee apple orchards.

At the apple exhibit of the International Shippers' Association at Milwaukee, the Boston-Okanogan Apple Company was awarded a silver cup for the sweepstakes prize for plate exhibits.

Spokane Valley apple growers and shippers seem convinced that they should sell no cull apples this year under \$20 a ton. It is expected that the market will open here at about that figure.

One of the largest land deals ever consummated in the Okanogan Valley was closed when Charles Simpson, an apple grower of Cashmere, purchased for \$60,000 from George H. Ellis and James E. Forde of Spokane 180 acres under the irrigation system. Eighty acres are in six-year-old apple trees and 100 acres in alfalfa and corn. The orchard is one of the finest in the county. It will yield nearly 10,000 boxes of apples this year, and with anything like a favorable season will produce from 18,000 to 20,000 boxes next year.



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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

IDAHO.

Concord grapes appeared on the market at Lewiston, Idaho, on August 22. The crop in the district is considered fair, and it is expected the demand locally will outstrip the supply. The prices are high, and the minimum for standard Concord, Muscatel and Flamme Tokays is expected to range about six cents a pound. Some white Sweetwater grapes have also been placed on the market.

Fruit growers and packers in convention at Lewiston, Idaho, went on record as favoring the adoption of the Washington pack for the marketing of Idaho fruit. The Washington pack was favored because it is so well established in Eastern markets, and is looked upon as a standard for Western apples. It is felt that the adoption of a new system, which would be unknown to consumers at the market centers, would benefit Idaho growers far less than the adherence to the Washington pack.

The Indian Cache Ranch in the Lewiston district is estimated to have produced about 75 tons of grapes this year. The Indian Cache Ranch is the largest vineyard in the Lewiston country, with an area of about 23 acres and an average production of three tons of the fruit to the acre. The entire crop is sold directly to the retailer, most of the crop going to the Western and Middle Western states. Little of the choice fruit is offered on the local market.

MONTANA.

The apple harvest in Montana is in full progress. All but the very late varieties, of which there are few, were ready to pick by the 20th of September. By October 5th practically all fruit was off the tree. Varieties were ready to pick two weeks earlier than last year and some even three weeks ahead of 1917.

Despite the earliness of the State Fair, an attractive apple exhibit was staged. Every important apple district in the state was well represented. While the majority of the prizes went to the Bitter Root apples, other districts had very commendable exhibits.

The county exhibits at the State Fair were a surprise to everybody. Even the "drouth stricken" sections so much talked about during the summer could not be distinguished by their exhibits.

During the early part of the season considerable fear was expressed that the late spring frosts had greatly reduced the fruit crop, but the harvest results showed that early estimates were short.

The color, size and general condition of all varieties, except Wealthies, are very satisfactory. The Wealthies, due to continued smoky conditions during August, were decidedly off color.

The labor supply is more plentiful than in past years. While unskilled labor receives from \$3.00 to \$5.00 per day, and skilled from \$5.00 to \$7.00, the growers feel justified in paying it as there is a brisk demand for all produce, and at the same time they realize that the laboring man must pay good prices for his needs.

While fruit prices vary in different districts there is a decided increase over those of last and previous years. Already growers are preparing to give their orchards better attention in the future on the strength of the upward tendency of the fruit market.

UTAH.

The annual "peach day" at Brigham, Utah, has developed into both a tradition and an institution. This year it was held on September 3rd. Great things from various parts of Utah and Idaho filled the peach center to overflowing. In the shady grove of the public park stands were erected where vast quantities of peaches and melons were dispensed free of charge to feed the hungry thousands. An excellent exhibit of fruit filled the show cases in another part of the park. In those cases Brigham displayed both her pride and her resources.

The peach shipping season at Brigham was on full blast at that time. In spite of both frost and drouth this year, the peach crop is the heaviest in the history of that section, and that is saying a good deal. Furthermore, prices are good, the growers getting from \$1.50 to \$1.80 a bushel for their crop. An air of smiling prosperity therefore pervades the place.



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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

Points on Art of Top Working

Continued from page 10.

tough that it springs back upon the scion and holds it firmly in place. The cherry and prune are sometimes cleft grafted with fair success, but the wood is more easily split and does not hold the scion as well as does apple and pear wood. Consequently, the bark graft is more popular for the stone fruits. The bark graft is best for healing over large cuts on both stone and pome fruits.

Cleft Grafting.

The equipment needed for cleft grafting consists of a fine-tooth hand saw, a grafting tool made of steel and equipped with a blade for making the split cut and a wedge for holding open this cut, a wooden mallet or a hammer, a small sack to hold the scions, and some grafting wax. If the weather is cold, the grafting wax should be kept hot in what is called a grafting pot. The essential features of these grafting pots are an alcohol lamp set in the bottom of a small bucket with holes made for draft and above a basin placed in the top of the pail to hold the melted grafting wax. Melted wax should be put on with a brush. In making the cleft graft, limbs of from one-half to two and one-half inches in diameter are chosen. These limbs are cut squarely across with a saw and the edges smoothed with a knife. The splitting tool is next brought into play and driven down into the center of the limb by blows from the mallet. A cut from an inch and a half to two inches long is made in this way. The splitting tool is then removed and the wedge of the tool is inserted near the center of the limb if it is a large one or at the side if it is small. The wedge is driven deep enough so that the scions may be placed at the edges of the cleft. Scions for grafting are chosen from the central portion of the one-year-old wood where the wood is mature and the buds are plump. Two or three buds are left on each scion. The scion is shaped by cutting a thin long wedge, starting on each side of the lowest bud, so that the buds will face outward when the scion is set. The outside of the scion should be cut a little thicker than the inside, in order that the cambium layer of the scion may be held firmly against the cambium layer of the stock. When the scion is set it should be slanted slightly toward the outside in order that the cambium layer may cross. If the limb is an inch and a half or more in diameter, two scions are usually set. If it is smaller, one only can be set. As soon as the scions have been set and the wedge removed, the graft is waxed very thoroughly along the sides and over the top and the tips of the scion are also touched with wax to prevent evaporation.

Bark Grafting.

In bark grafting the limb is cut at right angles with a saw as in cleft grafting. But, while in cleft grafting there are only two scions set, in bark grafting there may be several, usually about a couple of inches apart, around the edge of the cut. The scion for bark grafting



There was an old woman
Who lived in a shoe;
She had so many children
She didn't know what to do.
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is shaped by cutting a shoulder on both sides of the scion and leaving a thin wedge to be inserted between the bark and the wood of the stock. The bark of the stock is lifted slightly or is cut vertically at the points where the scions are to be placed. Then the scions are inserted. After all have been set they are waxed thoroughly and the tops of the scions are covered with wax. The scions are allowed to grow until they have covered, or nearly covered, the top of the wound and until they become rather crowded. Then they are gradually removed until two usually are left for permanent limbs.

For whip grafts old muslin torn in half-inch strips and soaked in the grafting wax when it is hot, or soft twine string soaked in wax, are often used in place of grafting wax.

New Data Secured on Northwest Nut Culture

THE annual tour of the Western Walnut Association this year, which included many field meetings and covered an area extending from McMinnville, Oregon, to Clarke County in Western Washington, proved a valuable trip to many of the growers now engaged in nut culture in Oregon and Washington. About 20 cars containing 70 members of the organization and others interested in this rapidly growing industry, which is estimated to cover at present 8,000 acres in Oregon alone, made the tour. The trip was made under the direction of J. C. Cooper, of McMinnville, president of the organization; Prof. C. I. Lewis, vice-president, and Dr. J. H. Wilkins, of McMinnville, of the executive committee, acting for Knight Percy, secretary-treasurer, who was unable to be present.

The tour, which covered only a small part of the acreage represented in the two states, demonstrated thoroughly the growing importance of the nut industry to the Northwest and that both the soil and climate of this region is especially adapted to the grow-

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ing of both the English walnut and the filbert to perfection. It also demonstrated that large yields of these nuts are soon to be put on the market from this section and that steps must be taken to handle and market them.

Walnut orchards both of the seedling and grafted types were found in all the districts visited in fine condition and with heavy yields. The discussions that took place developed the fact that there are strong adherents for both these types of walnut trees among Northwest nut growers and that at the present time it is so difficult to determine which has the advantage,

although scientific investigators are inclined to the opinion that the English walnut tree grafted onto the carefully selected black walnut stock, makes a better all round tree than the seedling. This is a point, however, on which Oregon walnut men are ready to debate at any time with considerable heat and bids fair to become as celebrated a contention as to who wrote the famous poetry and dramas accredited to William Shakespeare—Shakespeare or Bacon. An older and more extensive development of the walnut orchards in this section will probably solve this problem.

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One of the important features demonstrated was that blight, which is the bane of the walnut grower, was present only to a very limited extent in Oregon and Washington orchards. The filbert acreage visited was uniformly found to be in fine condition, with good yields where the trees were old enough to bear and comparatively free of pests and diseases of any kind.

The facts of greatest value learned on the trip are:

First, that while walnut blight may attack certain trees more than others, it is aggravated by poor soil or poor care.

Second, that one should be very careful in choosing the stock. If it is planned to top-work trees, only rapid growing stocks are desirable.

Third, the center leader tree, which has never been headed, has a great deal of merit. These trees have a good distribution of branches, are exceedingly strong, and undoubtedly more and more of this type will be grown.

Fourth, that the fundamentals of good walnut culture are: (1) Proper selection of site; (2) Very intensive tillage.

Fifth, that the filbert is bound to become a great horticultural asset. The Barcelona undoubtedly will be the leading variety, but that the Du Chilly is needed to pollinize the Barcelona, and that a third variety is needed to pollinize the Du Chilly. In some cases it is thought this may be the Daviana; in other cases, Clackamas or Turk, or possibly other varieties.

Among the interesting places that were visited on the first and second days were the orchards of Prof. Lewis and others at McMinnville, the Curfman orchard at Carlton, Withycombe and Malpas orchards at Gaston, the Forbis and Schoolcraft orchards at Dilley, the large establishment and nursery with many acres of stock of the Oregon Nursery Company at Orenco where dinner was served and a new cherry that bears several weeks after other cherries are off the market was eaten and discussed, and the Quarnberg, Shaw, Norelius, Root, Sturgess and Spurgeon orchards at Vancouver, Wash. In the latter district it was found that plant life of all descriptions was considerably earlier, and fruits and nuts more mature, than in the Oregon districts visited. On the third day visits were made to the places of the Frandquette Nursery Co. and the Walgamot orchards at Canby, Ore., and the plantings of Dr. Jobse, H. A. Kruse, J. R. De Nui and Mr. Stein near Wilsonville.

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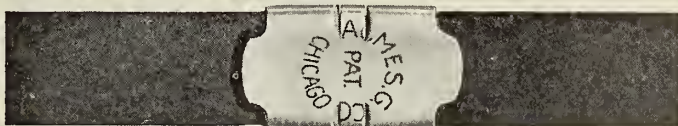
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The Fatality of Crown Gall, Etc.

Continued from page 9.

many of our states. In the vicinity of Shenandoah alone, where there are two nurseries, the loss in a bad year is often as high as \$40,000 or \$50,000. The annual loss in nurseries in the middle west is 20 per cent to 50 per cent of the total production, as all galled trees are a total loss.

Work is now being done on methods of control. Such means as selection of roots, various grafting methods, and disinfection of roots before planting have been tried. So far no satisfactory means of prevention has been found, although results have been encouraging.

There seem to be about four points that if borne in mind will reduce the losses due to this disease materially:

1. Secure healthy trees.
2. Plant in clean soil if possible.
3. Use resistant varieties.
4. Watch out for preventive methods.

A complete summary of this experiment to date can be obtained by sending for Research Bulletin No. 50, Iowa State College, Bulletin Section, Ames, Iowa. The bulletin was written by Laurence Greene and I. E. Melhus.

Orchardists Clash

An interesting clash of interests appears to have developed in the fruit producing district of which Spokane is the commercial center as between fruit growers and apiarists.

One side of the subject is set forth in a statement by E. B. Kelly, state agricultural inspector, who says: "Never before has the Inland Empire apple crop showed up the need of bees in this district as it has this year. Many apples will be lost this year because of lack of proper pollenization and although the loss does not compare with the frost damage, it is very noticeable. There are a few bees in the Inland Empire, but the majority of fruit growers depend too much upon

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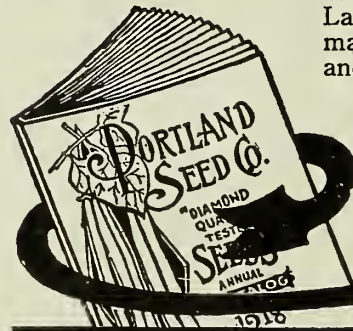
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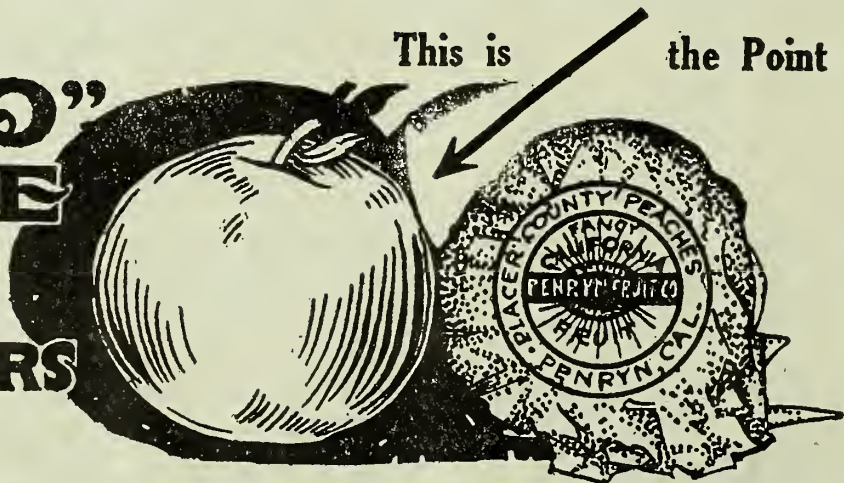
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"Caro" from DessiCARE (to dry up)

"Caro" Prolongs the Life of Fruit Why?

Fruit decomposition starts from a bruise which opens tiny holes and permits the juice to escape and BACTERIA to enter. "Caro" clings closely and dries up the escaping juice. "Caro" ingredients harden the spot, kill the BACTERIA, arrests the decomposition—and thus **PROLONGS THE LIFE OF FRUIT**. If your fruit is worth shipping it is worth keeping in best condition.

Demand "CARO"—Wrap Your Fruit in "CARO"—The Fruit Buyer Knows "CARO"

Order from Any Fruit Company or American Sales Agencies Co., 112 Market St., San Francisco

their neighbor's bees for charity work and sooner or later the live producer will see the need of having a good stock of bees on his own farm.

"If bees are introduced into the Inland Empire on a large scale, the farmers will first have to provide better means of feeding. Food secured by the bees during the first season will not be enough for their winter supply and every corner and nook will have to be sown in clover."

Quite another aspect is presented in a dispatch from Prosser, Wash, which said that a startling mortality among bees indicates an unusual shortage of honey in the Yakima Valley for the present season. Tons of honey were shipped from this locality last year and brought fancy prices. W. H. Tucker, who had over 200 stands of bees, which yielded him an income from \$25 to \$54 a stand last year, reports that he will have no honey for sale this year. Mr. Tucker reports his loss to be between \$10,000 and \$12,000.

He stated that the unusual value of the apple crop has caused orchardists to continue spraying much later than heretofore and in much heavier quantity. The chemicals in the spray fluids, he said, is killing the bees by the million. Mr. Tucker started this season with 250 stands, 50 of which have been entirely wiped out and no more than 10 to 20 per cent of the inmates of the remaining stands still survive. Other bee keepers in the Prosser district report similar damage.

The subject will be debated at fruit growers' conventions this fall. There seems to be a strong conflict of opinions as to whether the spray used to combat the codling moth is fatal for bees.

Dedicate Memorial to Rome Beauty.

At its summer meeting on July 23, the Ohio State Horticultural Society dedicated near the site of the original tree a boulder memorial to the Rome Beauty apple, the most important variety produced in the state. The original tree, a sprout from below the graft was planted near Proctorville, Ohio, in 1817, by a small boy whose father thought the tree a worthless seedling.

This apple has since been planted well over the country. It was carried to California in the gold rush of '49 via Cape Horn. Statistics for 1918 show that in the state of Washington it is exceeded in numbers only by Jonathan and Winesap. It has been planted largely, too, in Oregon and Idaho.

Its characters of late blooming, annual bearing, comparative resistance to fireblight and its late keeping coupled with its size and attractiveness, have made it a valuable apple, Ohio's most important contribution to the fruitgrowing industry.

R. B. CRUICKSHANK, Secretary.

The output of orchards in the Wenatchee district can be doubled by creating the proper soil conditions, the *Wenatchee Advance* announces, and advocates the planting of alfalfa in them as one means of helping.

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Actual tests prove one man with a MERRY GARDEN does more work and does it easier and better than four men do with hand cultivators. It works uniformly without slighting a single row. Goes between wide rows and astride narrow rows.

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The power is furnished by a reliable 2 h. p. gasoline motor controlled from the handles. Requires no pushing or pulling. Simply guide it along the rows. "It leads the way." When not used as a cultivator, the addition of a pulley frame furnishes power for small machine, such as the separator, churn, lawn mower, saw or grinder. Price of frame, \$10 extra.

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We allow a 5-day trial, backed by a rigid money-back guarantee. Order direct from this advertisement, as you are fully protected by this guarantee. If for any reason the MERRY GARDEN fails to do the work, purchaser in accepting same agrees to notify us within 5 days from receipt thereof. We reserve the right to send a demonstrator, and if machine fails, purchase money will be refunded. Price \$185.00, f. o. b. Cleveland, Ohio. Terms 10 per cent, or \$18.50, with order. Balance on delivery, with privilege of examination subject to five-day trial and guarantee. Shipping weight 250 pounds. For further information and particulars, address

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Gentlemen: Find enclosed \$18.50 for which ship the Merry Garden Auto Cultivator, balance to be paid on delivery. This order is placed subject to the terms of your money back offer.

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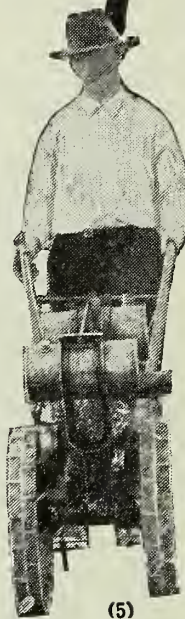
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(5)

Timely Advice, Etc.

Continued from page 4.

distinction. It sells on all markets for a greater price than any other variety. It has often sold for \$5.00 per box. However, the Delicious has its faults. It is not adapted to all regions, and often does not come into bearing young, although there are many exceptions, especially on certain soils in the Hood River Valley.

The Jonathan has many points to commend it. It is a rapid growing tree which comes into bearing early. It gives a high average yield per acre because it bears a good crop every year. It is a beautiful red apple of high quality. Its greatest fault lies in its tendency to develop fruit spot. These are small black spots which spread over the entire surface. Very often Jonathans which show no symptoms of the trouble when packed will very quickly break down or become spotted in the package. In many districts it is impracticable to store the fruit on this account. The remedy often lies in early picking and prompt marketing.

The Stayman and Winesap are two varieties which have found much favor in the markets. The former is a seedling of the latter and is a distinct improvement. The fault of the Winesap especially on poor soils is that it tends to run small as the tree becomes older. The Stayman is larger and of better quality and is reported as being more vigorous and more or less disease resistant. It comes into bearing early but is somewhat given to alternate bearing.

The Baldwin continues to be a favorite in the large markets. It does not compare in quality with the varieties mentioned or others which could be cited, nor does it come into bearing as young, but it has produced a profit to the grower in the districts where adapted. Its natural habitat lies north of the Ohio river and east of the Great Lakes.

Among the other varieties of note are the Rome Beauty and Grimes. The former is a beautiful fruit, of good size, symmetrical, easily packed, a good shipper and keeper. It readily sells well at good prices, principally because of its culinary value. It is not desired as a dessert variety, but is relished as a baking apple. The chief handicap of the Grimes is that it is yellow. Its chief market is in the Central States, but in other markets does not compete well with red varieties. It is reported as being short lived, due principally to a form of collar rot. This tendency is now being largely overcome by nurserymen who are double working with some other variety so that the Grimes will not come into contact with the ground.

The Ben Davis at Hood River is grown only in limited quantity from old trees whose owner still hesitates to grub them out or work them over to some more desirable sort. There have been no late plantings in this district. Its six year net average to the grower per box has been less than that of nineteen other varieties grown there. The day of the Ben Davis is past. As an

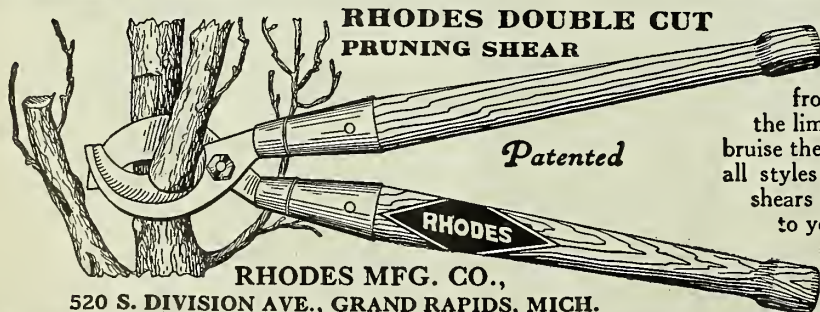


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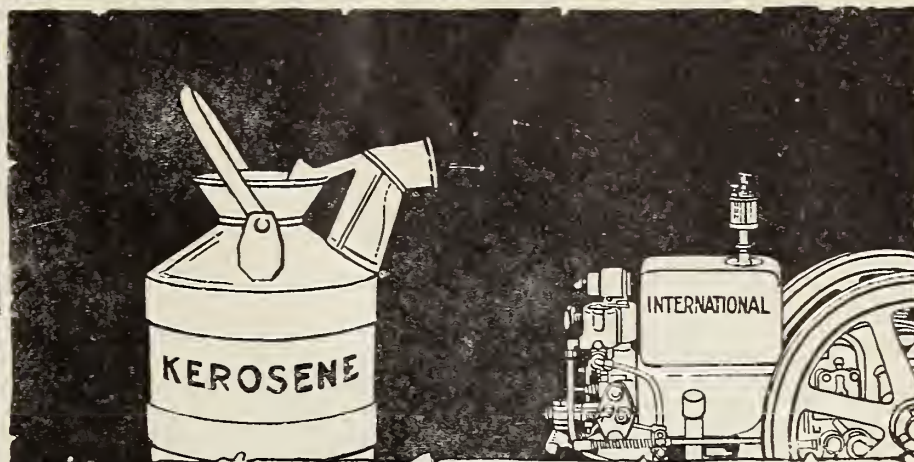
Write for circular and prices.

export apple it still has some possibilities on account of its shipping qualities.

Of summer and early fall varieties the following are favorites: Yellow Transparent, Red June, Duchess and King.

There are four varieties of pears which are at present very popular with the planter. The Bartlett stands first from the standpoint of acreage. It is estimated that from eighty to ninety per cent of all pear trees in California are Bartletts. It is a rapid grower and comes into bearing young. It bears large crops regularly and has wide adaptability to soils and climates. It matures its fruit early and is eagerly sought by canners and dryers at high prices and meets with a strong demand for dessert purposes. It is quite susceptible to fire-blight. The Anjou is another popular pear. Trees become very large and bear in early Fall. When young, trees have an irregular bearing habit. Very often they produce a heavy bloom but the fruit does not set well. It is thought by prominent horticulturists that this non-bearing habit while young is a natural characteristic since the trees when older bear heavily, although often irregularly. Others feel that it is largely a problem of pollination. The trees are subject to blight but less so than the Bartlett. The fruit is of high quality, a good keeper and sells well as a winter pear. The Bosc is an excellent variety which is increasing in popularity very rapidly because of its splendid quality as a dessert pear. It is a good keeper and sells for a high price. The trees come into bearing about the seventh to eighth year. It is a very regular bearer and averages high yields per acre. The trees do not become as large as the Anjou and probably will not give as high yields. The fruit has a very distinct shape, being large, acute pyriform, very long and narrow. The skin is yellow, somewhat rough and covered almost entirely with a heavy brown or cinnamon russett. The Winter Nelis is also an excellent pear but scarcely in a class with the varieties mentioned. The fruit is small, but the quality is excellent. When the trees become old they require considerable thinning in order to insure good size. The variety ranks high as a winter pear and often sells high. The Comice is an excellent pear but growers hesitate to plant this variety because it blights badly, comes into bearing quite late and in many places is a very shy bearer.

Fire-blight has been the principal drawback in pear growing, but much is being done to overcome this in growing resistant stocks upon which standard varieties may be budded or grafted. Professor F. C. Reimer of the Southern Oregon Experiment Station has taken the lead in this work and has disseminated to the trade a middle western variety known as Surprise. This tree is remarkably resistant to blight and is a vigorous grower with a slightly spreading habit. It makes a splendid tree to top-work after the second season's growth. He is also experimenting with a Chinese species of pear



You Wouldn't Haul Crops

to town on your back and yet you unnecessarily break your back doing a lot of odd chores around the farm such as sawing wood, turning the grindstone, pumping water for the livestock, etc., and let your wife and girls wear themselves out over the wash-tub, churn, and separator. Drudgery of this sort was absolutely necessary on the farm once upon a time—but times have changed.

There is no need to let these little jobs take the joy out of life, because an **International Kerosene Engine** will perform all of these tasks—and a lot more, besides—doing the work much faster and more cheaply, to say nothing of doing it better than it could be done by hand. These engines deliver steady, uniform power—they **never lag**—so any machine that they operate works to the best possible advantage. There are three sizes—1½, 3, and 6-h. p. engines.

The 1½ and 3-h. p. engines are the all-around "chore boys" while the 6-h. p. engine is the dependable "man about the farm". It does work that a dozen hired men couldn't do, such as shelling corn at the rate of from 1,000 to 1,500 bushels a day, baling 15 to 20 tons of hay in a day, grinding feed at the rate of from 5 to 25 bushels an hour, and threshing 20 to 40 bushels of wheat an hour (operating a Sterling thresher).

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WHEN WRITING ADVERTISERS MENTION BETTER FRUIT

known as *Pyrus usuriensis* which is absolutely blight resistant. Should it prove adapted in other ways to our conditions here it will prove a very valuable addition to the list of blight resistant varieties. Growers will do well to watch these varieties and note the outcome of these investigations.

In closing, the writer would urge the need of a thorough preparation of the soil preparatory to planting. A field which has been in alfalfa for a number of years if properly worked up provides an excellent place in which to plant trees. Lastly, he would emphasize the need of interplanting varieties for pollination purposes and to equalize the labor at harvest time. Plant the trees far enough apart to insure full development. See that soil and air drainage is ample, and where rainfall is insufficient that irrigation can be had. If the experience of successful growers is taken advantage of and a few simple rules followed success should follow.

Orchardists Buy Many Warehouse Sites

Orchardists in the Omak section, upper Wenatchee Valley, are solving loading problems along modern lines. At a recent government lot sale the bulk of the 200 lots offered adjacent to the right of way and industrial sites of the Omak Railway Company were purchased by orchardists for warehouse sites. The main line of the railway is less than a mile long but the sidings to take care of the fruit warehouses will be considerably greater in length.

An estimate of the outlay for storage facilities in the Wenatchee district is half a million dollars. At Monitor, for instance, the warehouses extend for 1000 feet along the track. The effect is odd in view of the fact that Monitor itself is a tiny hamlet. On the fruit farms a large number of sorting and packing houses are being installed to handle this year's output.

An interesting sidelight on the apple industry is the statement that in an effort to procure legislation whereby the standard box for apples as adopted by the state legislatures of Washington, Oregon and Idaho, will be adopted for the box apple zone of the West. Congressman J. Stanley Webster, of Washington, recently secured an appointment to appear before the committee on coinage and weights to discuss this subject.

Washington Strawberries Pay Well.

W. Munson and E. Mattin this year planted an acre and a quarter to strawberries near Wapato, Wash. The berries made an excellent yield. The first crop has been marketed and the gentlemen report a total of \$910.66 from the berries sold. Pickers were permitted to have several crates and a certain amount was kept for use of Messrs. Munson and Mattin. The vines will bear another crop this fall, which is expected to be larger than the one just marketed.

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Prince Albert is supplied in toppy red bags, tidy red tins, handsome pound and half pound tin humidors — and — in that classy, practical pound crystal glass humidor with sponge moistener top that keeps the tobacco in such perfect condition.

PUT a pipe in your face that's filled cheerily brimful of Prince Albert, if you're on the trail of smoke peace! For, no matter how sad has been your pipe-past or your experience rolling your own, P. A. will sing you a song of tobacco joy that will make you wish your life job was to see how much P. A. you could get away with!

You can "carry on" with Prince Albert through thick and thin and no matter how hard you test it out you'll find it true to your taste and tongue. You'll be after laying down a smoke barrage that'll make the boys think of the days in France!

P. A. never tires your taste *because it has the quality!* And, let it slip into your think-tank that P. A. is made by our exclusive patented process that cuts out bite and parch—assurance that you can hit smoke-record-high-spots without any comeback but real smoke joy! And, no matter how tender your tongue may be!

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